



Taylor & Mulder
Property and Casualty Consulting Actuaries

**MISSOURI PETROLEUM STORAGE TANK INSURANCE
FUND**

**LOSS AND LOSS ADJUSTMENT EXPENSE
RESERVE ANALYSIS
AS OF JUNE 30, 2018**

SEPTEMBER 2018

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September 19, 2018

Ms. Carol Eighmey
Executive Director
Petroleum Storage Tank Insurance Fund
P.O. Box 836
Jefferson City, MO 65102

**RE: ACTUARIAL ANALYSIS OF THE PETROLEUM STORAGE TANK INSURANCE FUND
AS OF JUNE 30, 2018**

Dear Ms. Eighmey:

Enclosed is the actuarial review of the loss and allocated loss adjustment expense reserves of the Missouri Petroleum Storage Tank Insurance Fund as of June 30, 2018.

The first section in the text of our report is the Executive Summary section. This section presents our Conclusions and Recommendations. It also describes the Purpose and Scope of our report, explains the Distribution and Use of our report, and provides the Conditions and Limitations underlying our work. This section of our report includes the Background section which provides information about the PSTIF program history.

The next section of the text of our report is the Actuarial Analysis section that describes the sources of data, our overall methodology, the selection of factors and specific methodologies and considerations by line of business. It also describes the selection of ultimate losses, and loss reserve discounting. The Exhibits section of our report follows the text of the report and includes all of our analyses.

Please feel free to call if you have any questions regarding any aspect of our report.

Sincerely,

Daniel W. Lupton, FCAS, MAAA, CSPA, MBA

Jane C. Taylor, FCAS, MAAA, JD

E. Toni Mulder, FCAS, MAAA, FCA

Enclosures

Missouri Petroleum Storage Tank Insurance Fund

Loss and Loss Adjustment Expense Reserve

Analysis as of June 30, 2018

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Executive Summary

Purpose and Scope

Taylor & Mulder, Incorporated (“T&M”) was requested by the Board of Trustees ("Board") of the Missouri Petroleum Storage Tank Insurance Fund (“PSTIF”) to conduct an actuarial review of the PSTIF's loss and loss adjustment expenses reserves as of June 30, 2018. This report contains our summary, conclusions and recommendations along with a description of the analysis underlying our conclusions.

Specifically, T&M was asked by the Board to conduct an actuarial analysis to include within its scope the following tasks:

- A review and opinion on the adequacy of current claim reserves of PSTIF,
- A projection of PSTIF's future claim liabilities, including an estimate on future claim severity and frequency, separately for each claim type, and
- An analysis of PSTIF's large loss claims, including:
 - Information on the typical lag time between the time when a claim is opened and the time it is identified as a “large loss claim,”
 - The history of losses and reserving practices on “large loss claims,” and
 - Information on how “large loss claims” are expected to impact the PSTIF’s future finances.
- An estimation of the claims impact on PSTIF's financial position of the December 31, 2025 sunset provision in the enabling legislation.

This report presents the results of those analyses. This report was prepared by Daniel W. Lupton, FCAS, MAAA, MBA, Vice President and Consulting Actuary, Jane C. Taylor, FCAS, MAAA, Principal and Consulting Actuary and E. Toni Mulder, FCAS, MAAA, FCA, President and Principal and Consulting Actuary.

In accordance with the requirements of the Actuarial Standards of Practice in making statements of actuarial opinion, we provide the following statements:

I, Daniel W. Lupton, am an Officer and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.

I, Jane C. Taylor, am Principal and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.

I, E. Toni Mulder, am President and Principal and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.

Background

In the early 1980s, the federal government recognized that an underground storage tank (“UST”) could present an environmental hazard. At the time, many underground petroleum tanks were fabricated of unprotected steel which was subject to corrosion and deterioration leading to contamination of the surrounding soil and, perhaps more importantly, nearby groundwater. By 1984, legislation was in place to permit the Environmental Protection Agency (“EPA”) to set standards for tank design, installation, and protection to minimize the danger of future releases of petroleum or other hazardous chemicals stored underground. Over the years since, there have been additional EPA standards and regulations for tanks to further strengthen measures to protect the environment and groundwater. Included in these rules are requirements for tank owners/operators to have minimum levels of financial resources to deal with leaks and spills that might occur. In Missouri, this financial requirement is generally met by the purchase of insurance, either commercially or through the PSTIF.

Missouri responded to the federal actions and established the PSTIF in 1989 to assist owners/operators of underground storage tanks in meeting federal financial responsibility rules. In 1992, the PSTIF began offering insurance to underground tank owners/operators to pay for the costs associated with petroleum leaks and spills in the state of Missouri. This coverage is provided on a claims-made basis.

The initial legislation enabling the PSTIF had a sunset date of December 31, 1998. Additional legislative actions have moved the date to 2003, 2010, 2020, and finally to the current December 31, 2025 sunset date. Consequently, all projections performed by T&M in this report assume a December 31, 2025 sunset date. PSTIF will be responsible for the cost of claims reported to it as of December 31, 2025. Claims reported after that date will not be handled by PSTIF without further legislation extending the sunset date.

House Bill No. 1364, effective August 28, 2018, was the most recent legislative action extending the fund's sunset date to December 31, 2025. In addition, the bill called for establishment of a task force of the general assembly, known as the "Task Force on the Petroleum Storage Tank Insurance Fund," to be composed of eight members with the goal of researching and compiling a report for delivery to the general assembly by December 31, 2018 on the following:

1. The efficacy of the petroleum storage tank insurance fund and program;
2. The sustainability of the petroleum storage tank insurance fund and program;
3. The administration of the petroleum storage tank insurance fund and program;
4. The availability of private insurance for above and below ground petroleum storage tanks, and the necessity of insurance subsidies created through the petroleum storage tank insurance program;
5. Compliance with federal programs, regulations, and advisory reports; and
6. The comparability of the petroleum storage tank insurance program to other states' programs and states without such programs.

This section of the bill expires on December 31, 2018.

In 1995, the Missouri mandate for protection was expanded to include cleanup of petroleum contamination from certain uninsured leaks and spills. Uninsured risks included operations that had been closed prior to December 31, 1997. Therefore, the PSTIF pays for remediation costs associated with uninsured aboveground and underground storage tanks that were taken out of use by December 31, 1997, even when the tanks were never covered by the PSTIF. In some cases, petroleum releases went undetected (for example, at old gas stations) for many years. When soil or water tests reveal petroleum contamination as a result of such disused sites and a party is identified who is willing to assume responsibility for directing remediation efforts, PSTIF will pay for the remediation associated with that leak or spill subject to certain criteria and after a deductible.

In 1996, PSTIF was opened to aboveground storage tank (“AST”) owners/operators to voluntarily purchase protection. Then in 2008, the Missouri legislature mandated that AST owners/operators demonstrate financial responsibility for liability arising from any leak or spill beginning in 2011. This increased the number of ASTs covered by PSTIF.

Extended reporting endorsements permit the reporting of claims for a period of up to five (5) years after the tank is retired from service or sold. PSTIF began offering extended reporting endorsements for AST owners/operators taking tanks out of service in 2002. Beginning in 2004, UST owners/operators have been able to buy an extended reporting endorsement. However, no extended reporting endorsements will cover claims reported after December 31, 2025, the sunset date in the most recent legislation.

In contrast to many such state funds, which often act more as government grant programs than insurance programs, the PSTIF requires tanks owners/operators to complete an application and be approved to receive a coverage document. The coverage document is either the Underground Storage Tank Participation Agreement or the Aboveground Storage Tank Pollution Liability Participation Agreement depending on the type of tank provided coverage. The application and approval process allows PSTIF to enforce compliance with ever-developing standards for tanks and the associated piping.

In the event that a leak or spill is discovered after the retroactive date of the PSTIF coverage (the date at which coverage initially attaches), PSTIF will pay for the first \$1,000,000 of the costs per event, subject to a \$2,000,000 annual aggregate. Each event carries a \$10,000 deductible.

PSTIF storage tank claims are categorized into the following groups:

- Insurance UST – Release: Underground storage tank petroleum releases from insured tanks;

- Insurance UST – Closure: Underground storage tank petroleum releases from insured tanks that were discovered when the tank was being removed from an insured site;
- Insurance UST – Other: Underground storage tank petroleum releases from insured tanks that do not fit into either of the above categories;
- Remedial UST: Cleanup costs associated with remediation of uninsured underground storage tank sites that were taken out of use prior to the deadline set by the Missouri Legislature;
- Insurance AST: Aboveground storage tank petroleum spills from insured tanks, and
- Remedial AST: Cleanup costs associated with remediation of uninsured aboveground storage tank sites that were taken out of use prior to the deadline set by the Missouri Legislature.

Terms Defined

ALAE Allocated Loss Adjustment Expense (“ALAE”) is the amount of money spent on a particular claim to the benefit of an insured, the amount that can be allocated to a single claim. These expenses include the attorneys’ fees, expert witnesses, collection and protection of material germane to the claim, etc. For the PSTIF, ALAE does not include Third-Party Administrator (“TPA”) expenses.

Claims-Made Claims-made coverage is a type of insurance coverage that provides protection for the insured on claims reported during the coverage period given that the incident giving rise to the claim occurred on or after the Retroactive Date (“retro date”). The retro date is usually the date the first claims-made coverage was issued to the insured. Coverage provided by PSTIF attaches on a claims-made basis.

Claims-made coverage may be contrasted to occurrence coverage, which responds to claims brought against the insured given that the incident giving rise to the claim

occurred during the coverage period. Both private passenger automobile and homeowners' policies are written on an occurrence basis.

Claim Frequency Claim frequency is the average number of claims per insured exposure. For PSTIF, an insured exposure is one tank insured for one year. For example, if 250 claims are reported in a year with 10,000 insured tanks, the claim frequency (average number of claims per insured exposure) is $250 / 10,000 \text{ insured tanks} = 0.025 \text{ claim per tank}$.

IBNR Incurred But Not Reported ("IBNR"), strictly speaking, is a reserve derived by actuaries for claims not as yet reported to the insurer for which premium has been earned and for which the insurer is responsible. Under this narrow definition of IBNR, claims-made coverages would not have IBNR as all claims are known at the end of the coverage period (or soon thereafter). However, the term IBNR for claims-made coverage is used in a broad sense and includes changes in incurred amounts (i.e., paid plus case reserves) for known claims.

Claim estimates done by a claim department or TPA must rely on information about the claim at a point in time. The available information may be lacking in important details that will greatly impact the ultimate cost of the claim. Actuaries review the data from the aggregated claims data by year as it changes over time, from the first report of the claim to settlement. From these reviews, the actuary can calculate factors to apply to current case data to estimate the ultimate costs of a body of claims. The difference between estimated ultimate values and current case incurred is IBNR.

Because coverage provided by the PSTIF is claims-made rather than occurrence, all references to IBNR in this report will typically refer exclusively to development on known claims unless otherwise noted.

LAE Loss Adjustment Expense (“LAE”) is the sum of Allocated Loss Adjustment Expense (“ALAE”) and Unallocated Loss Adjustment Expenses (“ULAE”) and represents the total costs of handling and defending claims.

LDF A Loss Development Factor (“LDF”) is calculated by an actuary from historical claim data and applied to current paid or incurred values to estimate ultimate claim costs for an insurer.

Pure Premium Pure Premium is the average cost of insurance per covered exposure. For PSTIF, a covered exposure is one tank insured for one year. An example might help clarify the concept. If two tanks are covered and one has a claim for \$100, then the pure premium (average loss per covered exposure) is $\$100 / 2 \text{ covered tanks} = \50

Severity Severity is the average size of claim for a given collection of claims. For instance, if the total cost for three claims is \$45,000, the claim severity (average size of claim) is $\$45,000 / 3 \text{ claims} = \$15,000 \text{ severity}$.

ULAE Unallocated Loss Adjustment Expense (“ULAE”) represents the expenses. For the Fund, ULAE represents costs associated with the TPA.

Conclusions

Loss and Allocated Loss Adjustment Expense Reserve Adequacy

T&M analyzed loss and loss adjustment expense reserves for the six broad categories of claims enumerated above. The following table shows the results of our analysis for these categories:

Missouri Petroleum Storage Tank Insurance Fund Undiscounted Unpaid Loss & ALAE as of June 30, 2018				
Claim Type	Case Outstanding	IBNR	Unpaid ALAE	Unpaid Loss & ALAE
Insurance UST - Release	6,665,892	5,200,853	77,890	11,944,635
Insurance UST - Closure	10,796,300	4,805,357	102,405	15,704,062
Insurance UST - Other	6,608,138	9,118,534	103,225	15,829,897
Remedial UST	19,415,970	4,393,197	156,277	23,965,443
Insurance AST	10,296,657	3,182,016	88,470	13,567,144
Remedial AST	2,310,237	677,910	19,613	3,007,760
Total	56,093,194	27,377,866	547,880	84,018,940

Projected investment income for this report was 1.64%, based on historical investment yields earned by the State. As a result, as shown in the second chart, above, investment income amounts to approximately 8.7% of undiscounted losses. Improvements in investment yield will increase this amount.

The following table shows the results of our analysis taking into account the effect of investment income:

Missouri Petroleum Storage Tank Insurance Fund Discounted Unpaid Loss & ALAE as of June 30, 2018			
Claim Type	Undiscounted Unpaid Loss & ALAE	Discount	Discounted Unpaid Loss & ALAE
Insurance UST – Release	11,944,635	1,032,534	10,912,100
Insurance UST – Closure	15,704,062	1,331,170	14,372,892
Insurance UST – Other	15,829,897	1,327,386	14,502,511
Remedial UST	23,965,443	2,018,303	21,947,140
Insurance AST	13,567,144	1,378,006	12,189,138
Remedial AST	3,007,760	239,399	2,768,360
Total	84,018,940	7,326,799	76,692,141

Although Remedial UST claims made up the majority of the case reserves, IBNR is concentrated in Insurance UST - Other, indicating greater development on known claims in that coverage. In the future, as remedial claims are closed and future remedial claims decrease in number (proportional to the decreasing number of remedial sites), we expect Remedial UST to decrease as a portion of unpaid loss and LAE compared to other claim types.

As of June 30, 2018, the PSTIF held \$82,893,195 in reserves for claims payable. This is \$1,125,745 deficient when compared with the undiscounted unpaid loss and ALAE, and \$6,201,054 redundant when compared with the discounted unpaid loss and ALAE.

Note that these reserves do not include a provision for claims not yet reported to the PSTIF as of June 30, 2018.

Unallocated Loss Adjustment Expense Reserve

If PSTIF were a commercial insurance company, statutory insurance accounting rules would require that all estimated future costs for claims administration for open claims be held as reserves. T&M has estimated those additional costs for Williams & Company Consulting, Inc. (“Williams”), the PSTIF third-party administrator, to handle all open claims until final settlement at \$14,585,282 on an undiscounted basis and \$13,313,386 on a discounted basis. This amount is not included in the tables above. This amount reflects the extended time horizon over which PSTIF claims are paid. The following chart shows the total liability including unallocated loss adjustment expense:

Missouri Petroleum Storage Tank Insurance Fund			
Discounted Unpaid Loss & LAE as of June 30, 2018			
	Undiscounted Reserve	Discount	Discounted Reserve
Loss & Allocated Loss Adjustment Expense	84,018,940	7,326,799	76,692,141
Unallocated Loss Adjustment Expense	14,585,282	1,271,897	13,313,386
Total	98,604,223	8,598,696	90,005,527

Loss and Loss Adjustment Expense Reserves (Including Unallocated) Needed at Sunset Date

If the sunset date of the PSTIF is not changed by the legislature, the ability for filing new claims will sunset on December 31, 2025. In order to estimate the reserve position of PSTIF as of December 31, 2025, T&M made several assumptions. The first assumption was that there would not be any increase in the rate at which releases are reported as the sunset date approaches, see Exhibits E-16 and E-20.

T&M also assumed that the releases reported from June 30, 2018 through December 31, 2025 will have the same average frequency and severity as the historical data, adjusted for trends in the data. Payment patterns by type of release were applied to the data to produce the needed reserves. The following table summarizes the anticipated reserve required to run off all claims reported as of the anticipated fund sunset date:

Missouri Petroleum Storage Tank Insurance Fund		
Unpaid Loss & LAE on December 31, 2025		
Assuming No Increase in the Rate of Reported Releases		
Reserve Study as of June 30, 2018		
	Undiscounted	Discounted
Unpaid Claim Expense	60,572,762	55,290,567
Unpaid Allocated Loss Adjustment Expense	397,582	362,911
Unpaid Unallocated Loss Adjustment Expense	10,584,158	9,661,175
Total	71,554,502	65,314,654

As discussed above, these unpaid claim amounts do not take into account the possibility of increased claim reporting in the period leading up to the fund sunset, nor do the above reserves include amounts required for overhead expenses such as salaries of fund personnel. Discounted losses are calculated using an investment yield of 1.64% which is consistent with current financial documents prepared by PSTIF.

Reserving Practices

Claims handling and underwriting is provided by Williams under a contract with the PSTIF. The Williams claim staff is headed by David Walters, who brings insurance industry experience to the

claims handling team. Much of the remaining staff has a technical background in engineering or geology and significant experience in handling claims for the PSTIF.

Williams' claim philosophy entails providing a swift response to reports of covered leaks and spills in order to minimize further contamination and the associated increased liability. A swift response also enables the claim department to secure pertinent physical evidence (such as damaged piping, valves, etc.) before it is discarded. Discussions during the preparation of this report indicate that the claims philosophy has not changed, although there has been a concerted effort to decrease the time between the receipt of a claim and its closure.

Claims handling is somewhat different than that of an insurance company in that the PSTIF was created to protect the environment and the citizens of Missouri from the impact of petroleum releases. Therefore, the claims handling effort is focused on reasonable and necessary costs for effective response to the leak or spill. The number of PSTIF lawsuits appears relatively modest when compared to commercial general liability insurers. Those claims involving lawsuits have defense counsel assigned as would be expected.

Claims are handled by having the contractor or the consultant hired by the owner/operator submit a proposed work plan and estimated costs to the PSTIF. The planned costs may be challenged by the claims adjuster to craft a more reasonable response if required. Proposed costs must be deemed "reasonable" to be approved. Once the project is started, invoices are submitted to the PSTIF for reimbursement.

Remedial claims present a unique situation that would not be encountered in a commercial insurance company. Often the site has been abandoned completely or converted to a different use. Remedial

claims generally move forward only when a party is willing to step forward and participate in the remediation process, which usually includes paying the first \$10,000 of cleanup costs.

Adjustors are also charged with establishing appropriate case reserves for the PSTIF. In insurance companies, aggregate incurred values (paid plus case reserves) tend to increase over time as more information regarding claims becomes known. Overall, PSTIF incurred values produce low loss development factors, which indicates that the case incurred values are a reasonable indicator of the ultimate cost of PSTIF claims, particularly for the UST Closure and UST Remedial claims.

When the proposed work plan for the leak or spill site has been completed and all monitoring results are within required limits, the claimant's environmental consultant informs the Missouri DNR that the impact of the leak or spill meets the DNR's remediation standards. Once notified by the claimant's environmental consultant, the DNR will then issue a "No Further Action" ("NFA") letter, meaning the claim is now considered closed. Claims not actively being managed by the owner/operator (i.e., cleanup activities have been abandoned or monitoring is not in place) are placed in suspense. Essentially, this means that the claim is not progressing toward the issuance of an NFA letter by the Missouri DNR. These stalled claims are removed from the suspense list and handled in a normal manner if someone again takes an interest in completing the cleanup at a future date.

Underwriting

Williams also provides underwriting services as part of its TPA function. Underwriting guidelines are established by the PSTIF and Williams to determine the insurability of any given tank. An application for coverage with the PSTIF must be filled out by the tank owner/operator along with a method of securing payment of the \$10,000 deductible. In addition, the tank owners/operators must demonstrate that the tanks and associated piping under their control are not currently leaking.

Coverage attaches on a claims-made basis which means that claims must be reported during the coverage period in order to be covered. Remedial claims are covered as reported without the requirement that coverage was in effect at the time of the release. If the tank system(s) that leaked is/are still in operation, however, coverage must be continuously maintained.

Data required on the application for insurance with PSTIF for UST installations include such items as the installation date, the tank capacity, the type of product contained, type of tank (e.g., single walled, double walled, fiberglass, etc.), type of piping, and details on overfill and leak protection. The PSTIF application for AST's requires similar documentation requirements along with information on the secondary containment system in place.

Applications for coverage with the PSTIF are reviewed by Williams' personnel and deficiencies are noted. Coverage documents are only issued if the application information is found to be satisfactory.

Projection of Future Loss and Loss Adjustment Expense, Claim Severity, and Frequency

T&M was asked to estimate costs for claims to be reported in 2019 and subsequent years, i.e., claims that have not yet been reported to PSTIF. To perform this projection, T&M applied several methodologies to estimate future loss and loss adjustment expenses based on claim frequency and claim severity for each claim category. For purposes of our initial projection of reserves needed as of December 31, 2025, we assumed that claims reporting would proceed as normal with no increase in reporting due to the impending sunset date. This permitted the assumption that claims reporting would proceed as normal. In addition, T&M created scenarios that might represent an expected influx of claims should the program not have its termination date extended.

Projection of Frequency and Severity

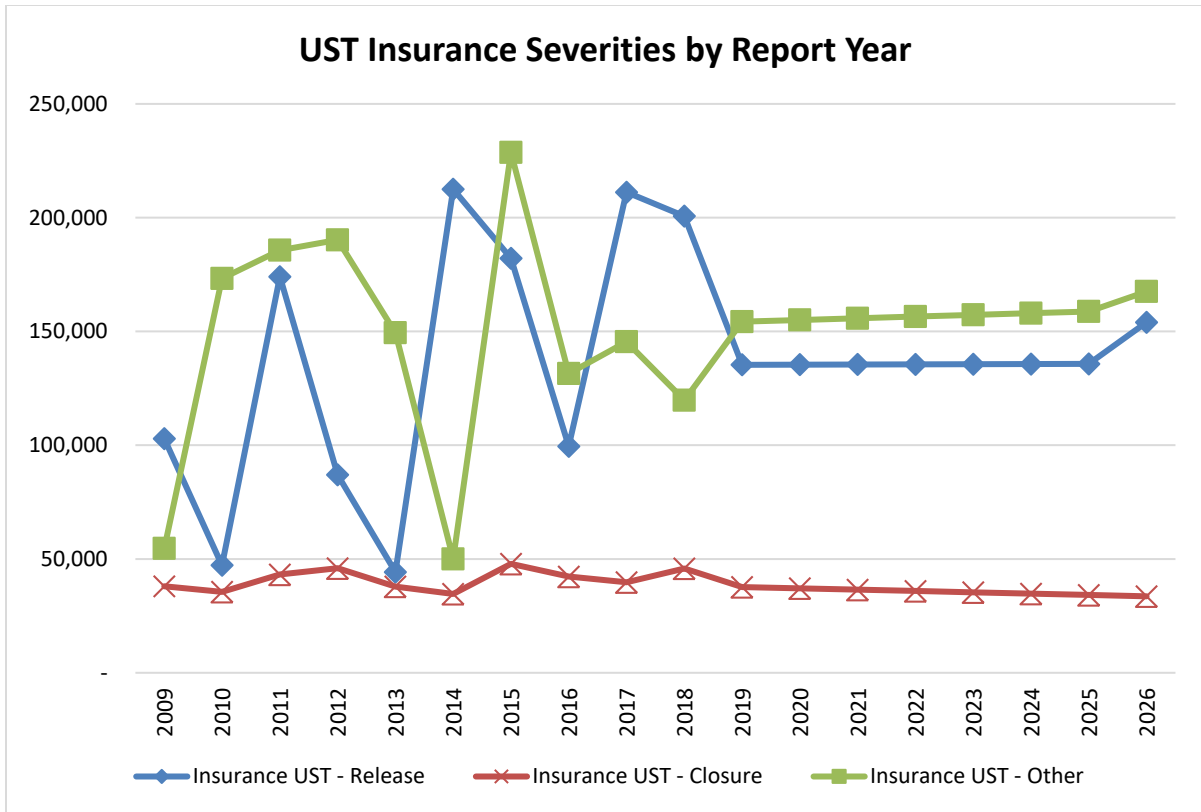
As part of projecting the financial condition of the PSTIF through December 31, 2025, we estimated (1) future claims reporting and (2) future claim severity for each claim category.

To project future reported claims counts, T&M used a variety of regression techniques. The results from those analyses led us to project relatively flat claim count patterns in the future for most claim types and modest declines in claim counts for Insurance UST – Closure and Insurance UST – Other claim types.

Analysis of coverage in-force indicates a modest negative trend in the number of UST tanks with in-force coverage and a positive trend in AST tanks with in-force coverage. In the case of in-force AST coverage, the PSTIF provided a likely maximum penetration of 80% to 85% of the total population of 1,208 sites with ASTs. Our projections suggest that the number of AST tanks with coverage agreements in-force will approach 1,027 (85% of the total population) asymptotically over the next several years.

The current analysis of average claim severities this year suggests that Insurance UST – Release will remain relatively stable around \$135,500 per claim on average. Insurance UST – Other and Insurance AST claims will tend to increase modestly in average severity over time, with increases of 3.0% to 4.5% (respectively) over the next seven years, an average increase of 0.41% to 0.63% per year, respectively. Insurance UST – Closure claims will tend to decline in average severity over time. Remedial claims of all types will tend to stay at about the same average severity level over time.

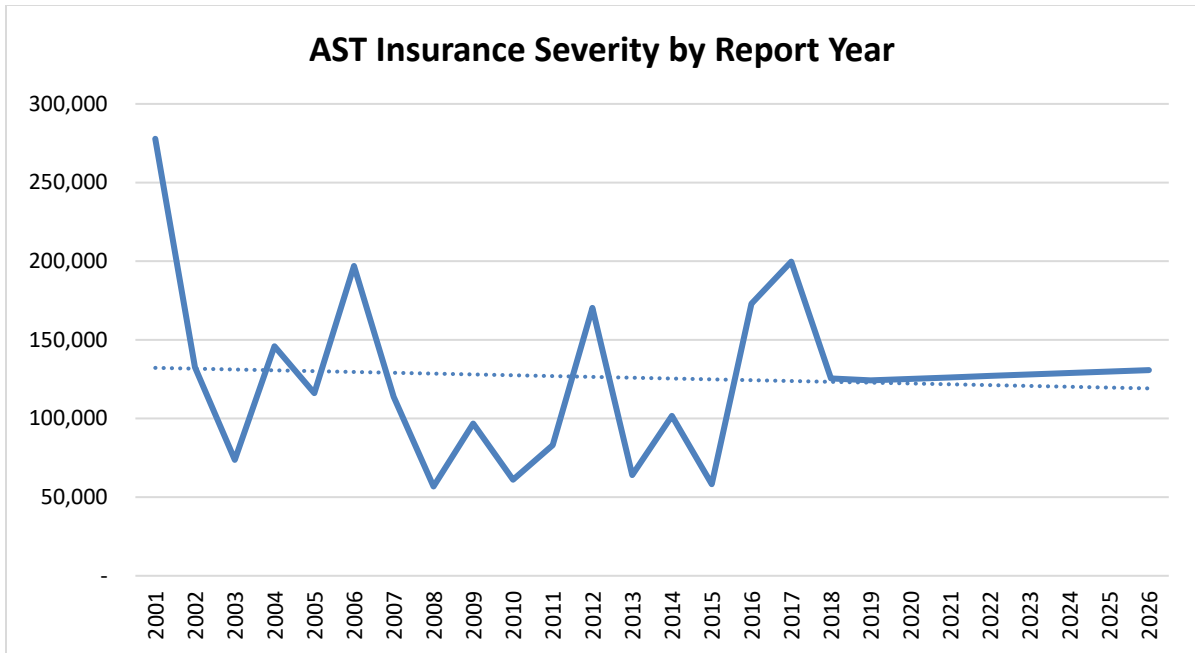
The following four charts show claim severities over time. The first chart displays the Insurance UST claim severities over time from Report Year 2009 to Report Year 2026:



Note that everywhere they are discussed in this report, Report Years are based on the fiscal year in which a claim was opened. A claim that was opened in or after July 2017 will have a Report Year of 2018 to match the fiscal year ending June 30, 2018.

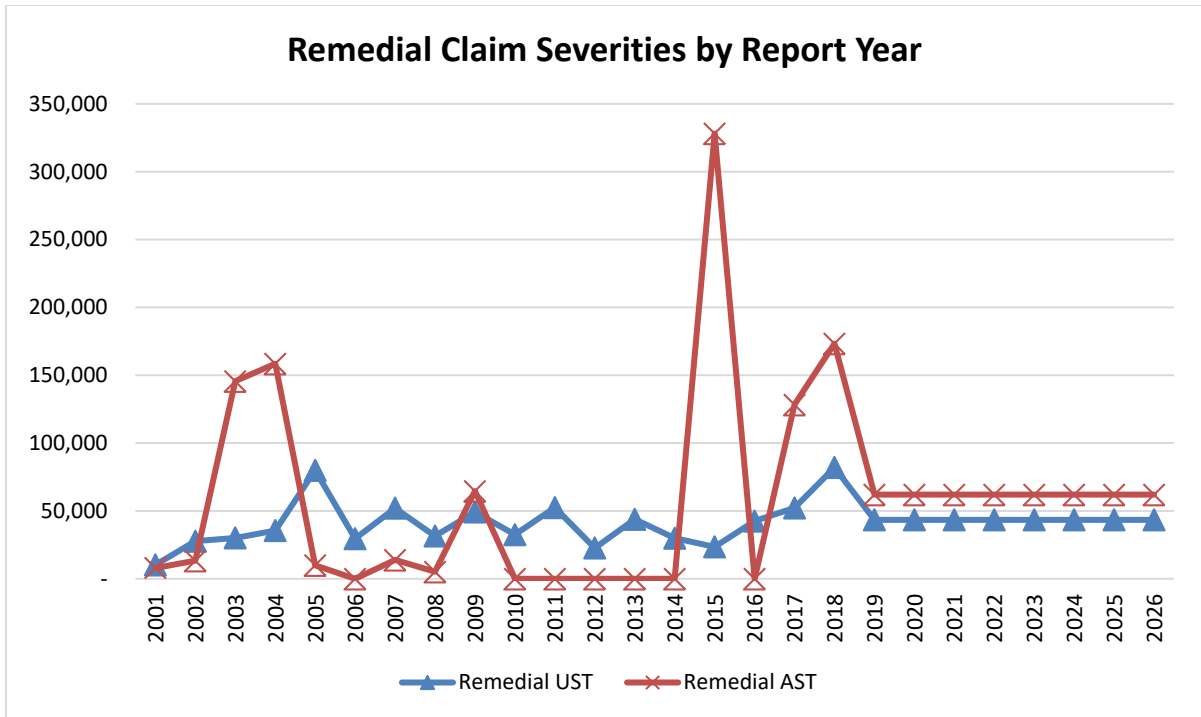
As this graph shows, the average severity for the “Release” and “Other” claim types have generally fluctuated between \$50,000 and \$250,000, while the “Closure” claim type has shown very stable average severity over time. This stability may be attributed to the higher number of “Closure” claims compared to other Insurance UST claim types, which creates lower volatility.

The following chart shows the average claim severity from Report Year 2001 to Report Year 2026 for Insurance AST claims:



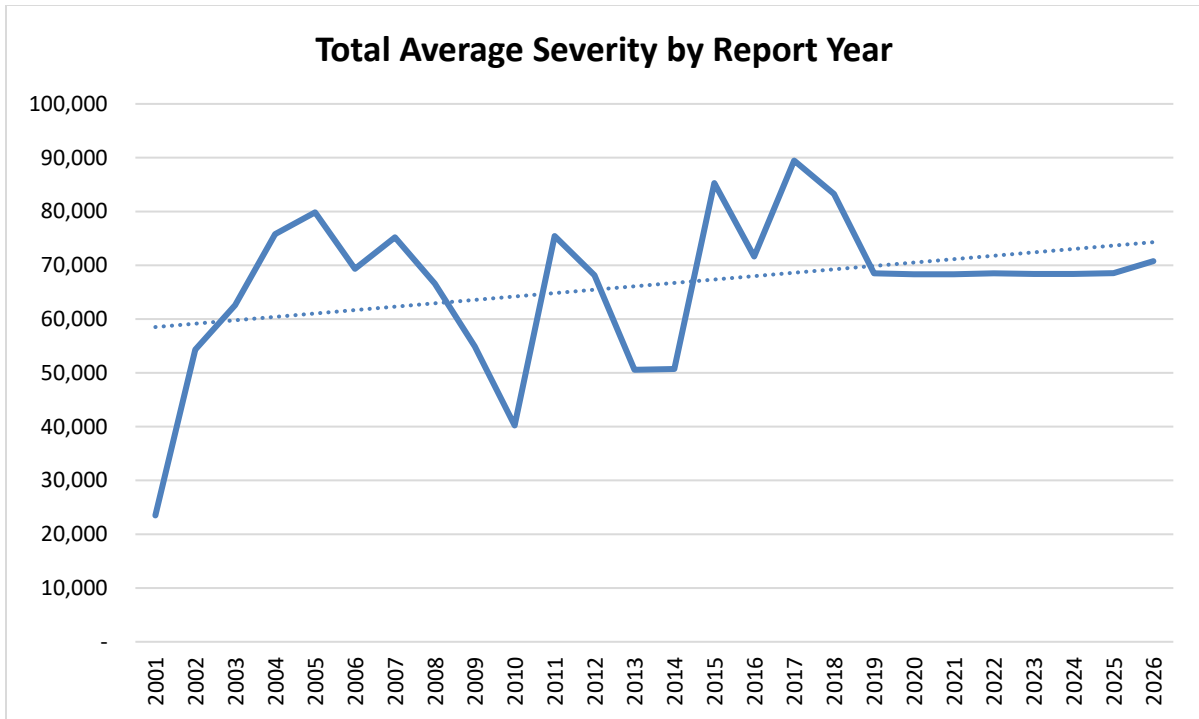
As this chart shows, the average severity of Insurance AST claims has shown significant volatility over time. Given the repeated spikes and troughs in severity since the early 2000s, it is anticipated that severity will continue to fluctuate between \$50,000 and \$200,000, with an average of \$125,000.

Finally, the following chart shows the average severity of Remedial UST and AST claims from Report Year 2001 to Report Year 2026:



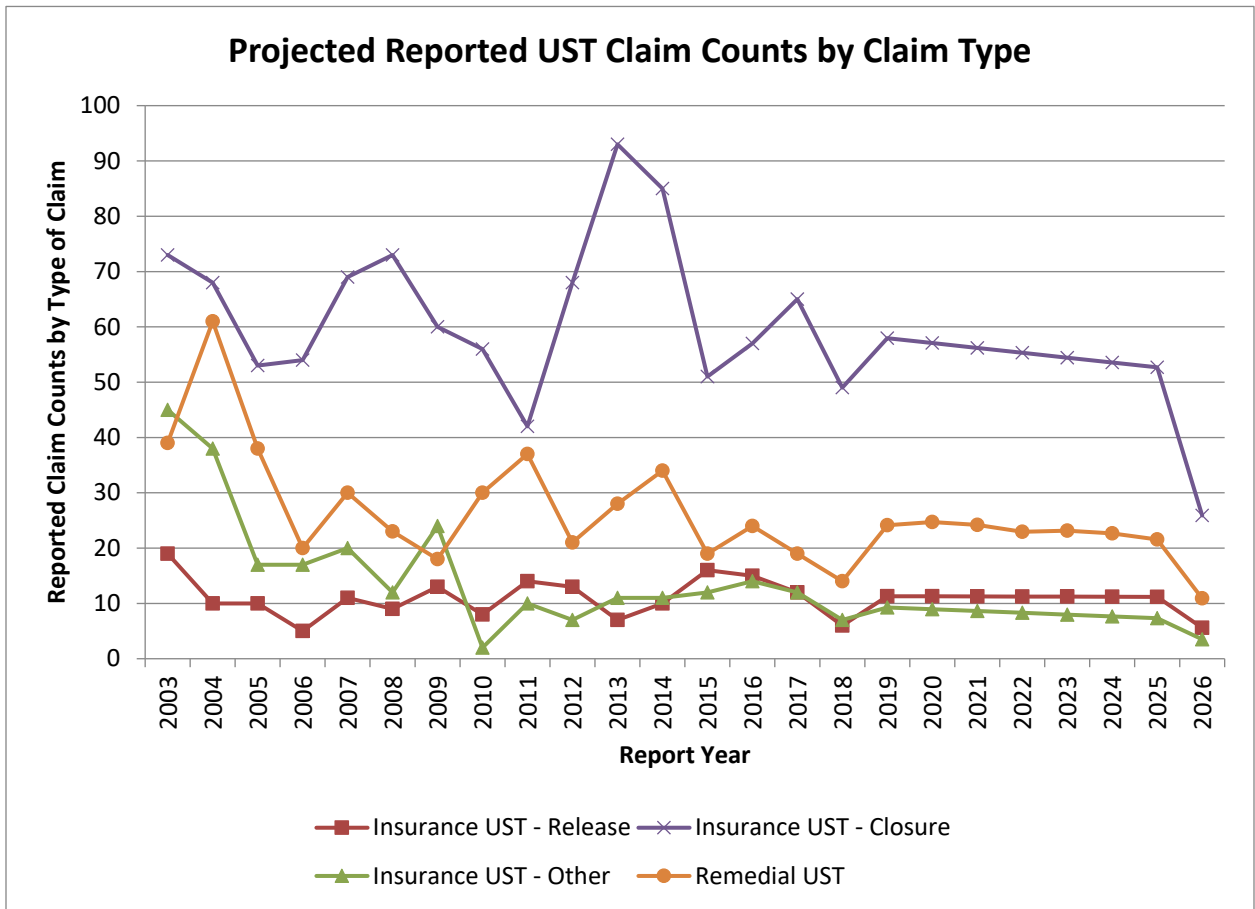
As this chart shows, with the exception of an outlier year in 2015 (caused by a single very large claim), the remedial claim severities have remained relatively stable over time. Projections for future years are consistent with this.

Finally, the following chart shows the combined total average severity over time:



As this graph shows, the overall average severity has increased modestly since the mid-2000s. This appears to be not the result of increasingly severe claims, but rather a result of a changing mix of claim types. As claim types with higher average severities make up a larger percentage of total claims and claim types with lower average severities make up a smaller share, the average severity has drifted upward over time. Future Report Year projections reflect an anticipation of relative stability in future severity.

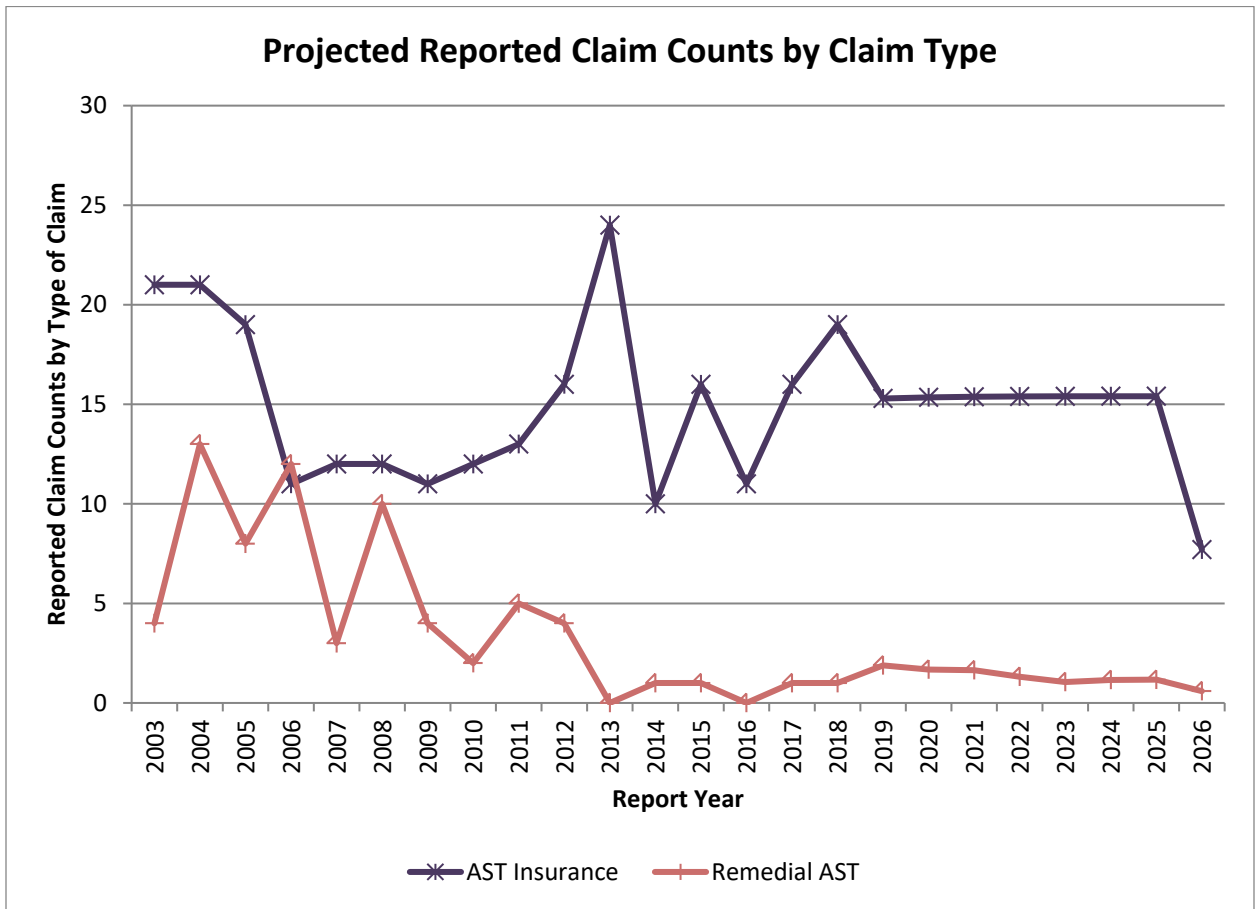
In addition, we performed an analysis of claim frequencies over time. The following chart displays historical and projected claim counts by UST claim type:



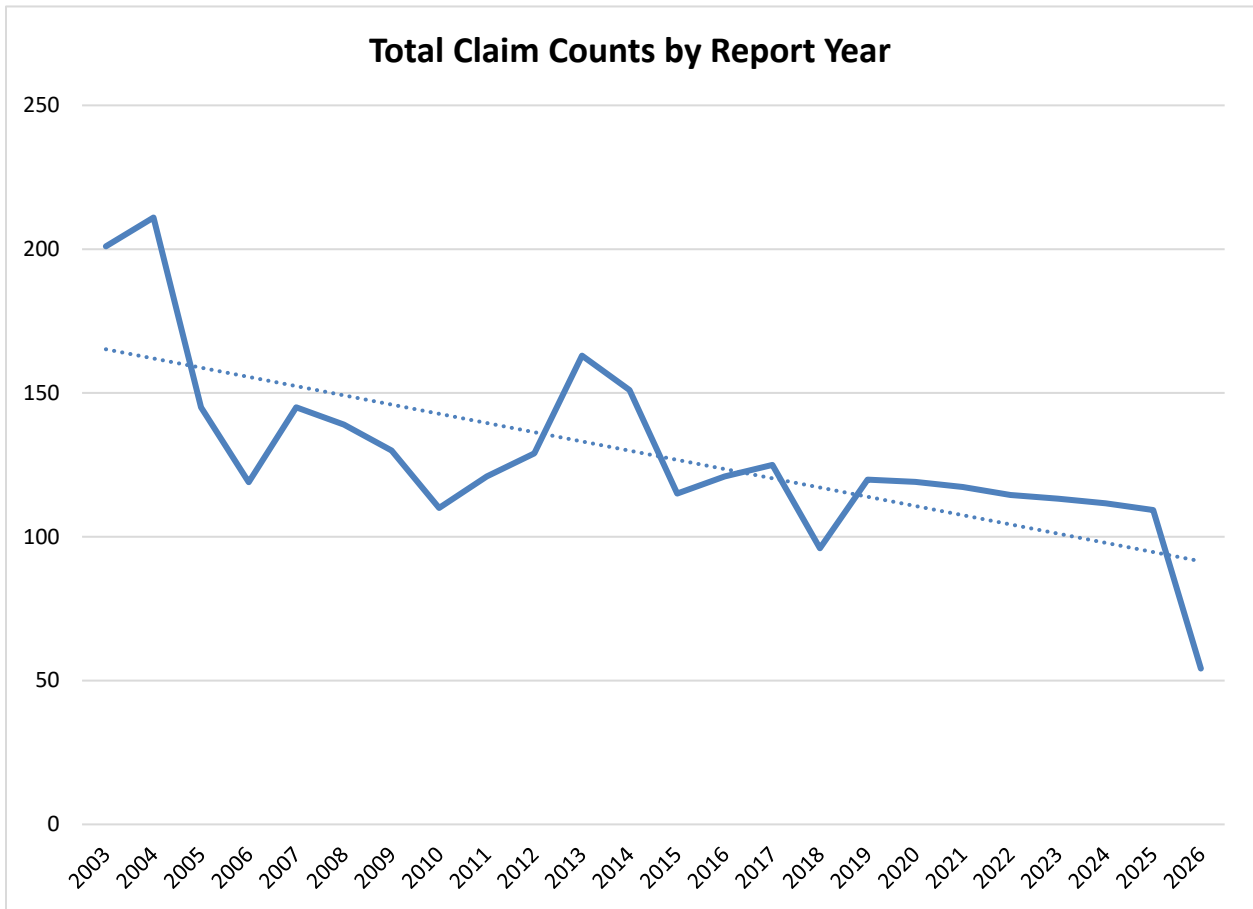
Note that we have excluded the Report Year 2000-2002 years because the remedial claim types have a significant number of claim counts in those years that make the chart unreadable due to the scale. The decrease in Report Year 2026 is due to the fact that claims cannot be reported past the sunset date, which falls half-way through the Report Year.

As this chart shows, the “Insurance UST – Closure” claim type has dominated since 2003, but generally slopes modestly downward over time. The second most common claim type, “Remedial UST,” appears to also be in slow decline. All other claim types appear to have leveled off by 2018, with the exception of some expected annual volatility, and therefore we anticipate that these claims will continue at roughly the same frequency levels in the future.

Similarly, the following chart shows the historical and projected claim counts by AST claim types:



The following chart shows the total claim counts by Report Year:



This chart shows some modest if volatile decline in reported claim counts through 2018. Projected future years continue under the assumption of a modest decline in total claim counts.

Projection of Revenues

The PSTIF has two primary sources of revenue: transport load fees (“TLF”) and participation fees, which is the actual premium charged for the insured risks. Transport load fees are charged to transporters of petroleum on a per load basis. TLF make up the majority of the PSTIF revenues. From 2001 until September 1, 2008, TLF fees were \$40 for 8,000 gallons of petroleum product transported. On September 1, 2008, the TLF fee was reduced to \$20 per 8,000 gallons of petroleum product transported and that charge has remained constant. Enabling legislation grants PSTIF the authority to

raise the TLF should the need arise. The overall maximum TLF is set at \$60 per 8,000 gallons of petroleum product by legislation.

Participation fees are charged to tank owners/operators on the basis of the number and categories of tanks insured. For USTs, the participation fee is \$100 per tank for double-walled tanks, and \$125 per tank for single-walled. For ASTs, the fee is \$100 per tank for tanks with a capacity less than 25,000 gallons and \$200 per tank of 25,000 gallons or more. A “new tank” charge of \$100 per tank is a one-time premium payment in addition to the participation fee for both UST and AST tanks payable during the first year of insurance with PSTIF.

T&M has relied on projections of future revenues provided by the PSTIF. We have reviewed these projected revenues for reasonableness and found they are reasonable based on current economic conditions. However, T&M has not attempted to quantify the potential impact on PSTIF revenue of the move to more fuel-efficient vehicles and to alternative vehicle fuels. In addition, no attempt has been made to quantify the impact of significant changes in fuel prices on the TLF revenue stream.

Projection of Future Cash Flows

T&M was asked to project cash flows to the PSTIF for a five-year time horizon. To perform this analysis, we combined projections of future claim frequencies and severities, projections of future revenues, and projections of future expenses associated with the PSTIF’s third-party administrator.

Future paid losses were simulated based on assumed probability distributions for frequency, severity, and claim payment speeds. Simulated claim payment speeds also affected the payout speeds of unpaid claims from historical Report Years.

The following page shows the projected cash flows from July 1, 2018 through December 31, 2025 assuming no influx of claims due to the sunset of the PSTIF program:

Financial Projections Based on PSTIF 2018 Projections

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
	Annual Revenues Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(1)	Transport load fees	11,500,000	11,450,000	11,400,000	11,350,000	11,300,000	11,250,000	11,200,000	5,575,000	85,025,000
(2)	100 Initial tank fees	17,000	17,000	17,000	17,000	17,000	17,000	17,000	8,500	127,500
(3)	UST participation fees	890,000	890,000	890,000	890,000	890,000	890,000	890,000	445,000	6,675,000
(4)	AST participation fees	330,000	330,000	330,000	330,000	330,000	330,000	330,000	165,000	2,475,000
(5)	Interest income	785,000	705,714	617,173	542,770	477,227	416,585	359,177	152,035	4,055,681
(6)	Total Revenues	13,522,000	13,392,714	13,254,173	13,129,770	13,014,227	12,903,585	12,796,177	6,345,535	98,358,181
	Administrative Expenses Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,265,000	2,219,700	2,175,306	2,131,800	2,089,164	2,047,381	2,006,433	983,152	15,917,936
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	90,000	90,000	90,000	45,000	675,000
(9)	Office of Administration	82,401	84,873	87,419	90,042	92,743	95,525	98,391	50,671	682,066
(10)	Section 319.107 Expenses	10,000	10,300	10,609	10,927	11,255	11,593	11,941	6,149	82,774
(11)	Underwriting	555,650	572,320	589,489	607,174	625,389	644,151	663,475	341,690	4,599,337
(12)	Inspections	342,351	352,622	363,200	374,096	385,319	396,879	408,785	210,524	2,833,776
(13)	Training & Loss Prevention Services	12,000	12,360	12,731	13,113	13,506	13,911	14,329	7,379	99,329
(14)	Other Professional Expenses	431,135	444,069	457,391	471,113	485,246	499,804	514,798	265,121	3,568,676
(15)	Legal Expenses	200,000	206,000	212,180	218,545	225,102	231,855	238,810	122,987	1,655,480
(16)	Department of Revenue	45,303	46,662	48,062	49,504	50,989	52,519	54,094	27,858	374,991
(17)	Attorney General's Office	42,918	44,206	45,532	46,898	48,305	49,754	51,246	26,392	355,249
(18)	PSTIF Board/Staff	290,700	299,421	308,404	317,656	327,185	337,001	347,111	178,762	2,406,240
(19)	Department of Natural Resources	1,621,657	1,670,307	1,720,416	1,772,028	1,825,189	1,879,945	1,936,343	997,217	13,423,102
(20)	Total Administrative Expenses	5,989,115	6,052,838	6,120,739	6,192,895	6,269,392	6,350,316	6,435,756	3,262,904	46,673,956
	Claim Payments Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(21)	Average / Expected	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	9,604,324	4,546,594	82,171,552
(22)	Cash balance @ 6/30/18	45,933,353								
	Funds Available at Fiscal Year-End:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	
(23)	Average / Expected	40,088,122	35,140,876	31,018,971	27,151,612	23,627,186	20,153,893	16,909,989	15,446,026	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

This chart shows projected revenues, projected expenses, projected claim payments, and projected cash available at year-end. For example, the actuarial central estimate is that \$13.4 million in losses will be paid in fiscal year 2019 in addition to \$6.0 million in administrative expenses. Revenues are expected to total \$13.5 million, leaving a cash balance of \$40.1 million at fiscal year-end 2019. As of December 31, 2025, the actuarial central estimate suggests that there will be a remaining cash balance of approximately \$15.4 million. This balance assumes that the fund will sunset on December 31, 2025 and that there will be no increase in claim reporting as the fund sunset date approaches.

Exhibit E-20 expands on this chart by showing claim payments and the resulting cash balances at various confidence levels. For example, there is a 50% probability that the cash balance as of December 31, 2025 will be greater than or equal to \$16.6 million.

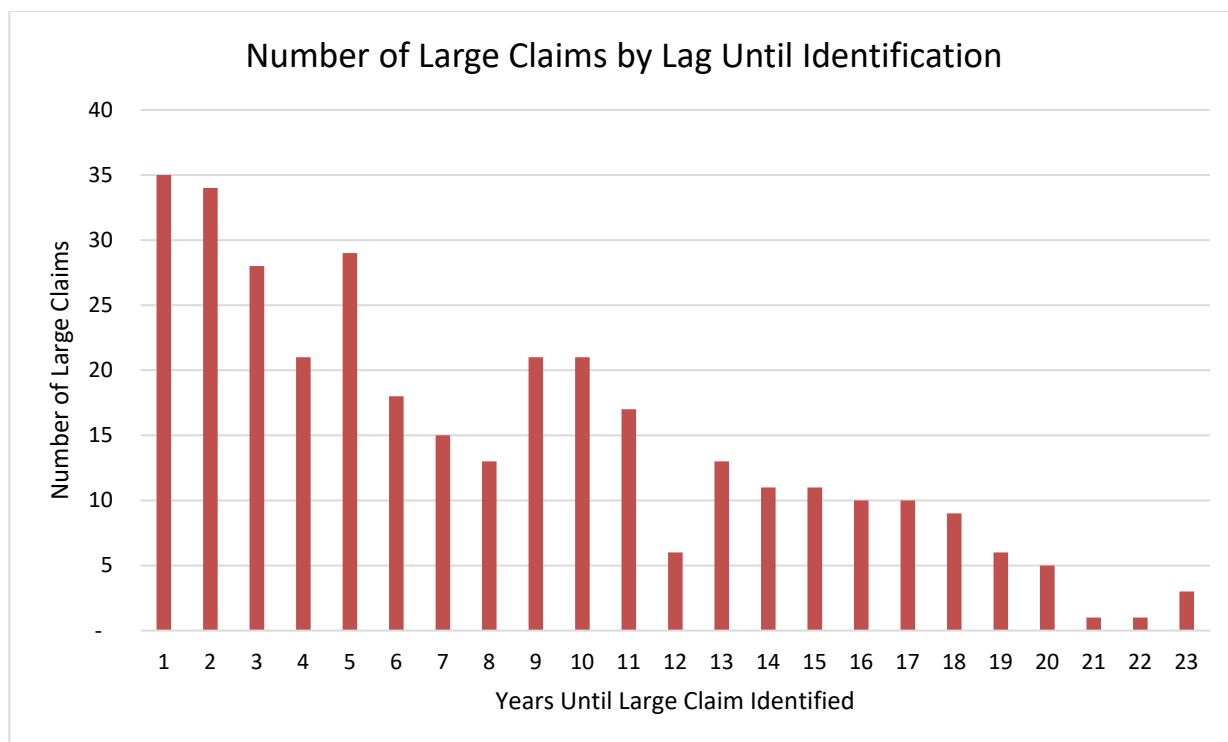
Exhibits E-21 through E-23 show alternative cash flow scenarios based on the possibility that claim reporting will increase if the fund approaches the sunset date. In these cases, we projected increases in remedial, closure, and “other” claims leading to increased claim costs in 2021 and the first half of the 2026 fiscal year (at which time the fund is projected to be sunset). The financial results of these scenarios are also shown graphically in Exhibits E-17 through E-19.

Exhibit E-24 provides the total projected claim payments for future fiscal years assuming no increase in claim activity. The first section of this exhibit displays future anticipated claim payments arising from currently reported claims (i.e., Report Years 2018 and prior). The second section displays claim payments arising from claims that will be reported in the future (Report Years 2019 and after). The third section displays the total of these two amounts.

Large Loss Claims

Large loss claims are defined as claims that meet or exceed the level of \$250,000. T&M performed several analyses of large loss claims. These analyses included (1) calculation of the amount of time after a claim is reported for it be identified as “large,” (2) consideration of factors that increase the likelihood of a claim being a large claim, (3) consideration of reserving practices for large claims, and (4) consideration of the financial impact of large claims.

Using net incurred losses, T&M examined the current set of claims that have been identified as large. On average, these claims passed the \$250,000 incurred threshold between the 7th and 8th years after report. Specifically, the claims were identified as large on average at 95.76 months, which is just before the 8th year (96 months). This represents a slight increase from the previous evaluation in which the average time was 93 months. The following chart shows the number of large claims by the time it took to identify the claims as “large”:



This length of time is not unexpected. Development on storage tank claims is slow as compared with many other insured lines of business. There can be a significant period of gathering more information, remediating, of testing and monitoring sites, of further remediation, of possibly re-opening claims, etc., which can lead to a long time period between the initial report of the claim and a determination of the ultimate liability.

Additionally, it is often the case that reserving is performed based on what is the “most likely” outcome (i.e., the mode of the distribution of potential reserves). As a result of this, initial reserves for any line will tend to resemble the most common claims, with large claims identified only as information allows the adjuster to distinguish less common features of claims that might lead to a large claim.

The following chart shows claims currently identified as large as a percent of total reported claims by Report Year:

Missouri Petroleum Storage Tank Insurance Fund
Large Claims as a Percent of Total Claims by Report Year
As of June 30, 2018

Report Year	Total Claims	Large Claims	Percent Large
1994	71	3	4.2%
1995	70	4	5.7%
1996	1,203	79	6.6%
1997	258	19	7.4%
1998	423	28	6.6%
1999	409	27	6.6%
2000	493	36	7.3%
2001	489	21	4.3%
2002	247	12	4.9%
2003	196	12	6.1%
2004	188	16	8.5%
2005	134	10	7.5%
2006	105	7	6.7%
2007	140	10	7.1%
2008	127	9	7.1%
2009	124	3	2.4%
2010	96	2	2.1%
2011	86	6	7.0%
2012	94	5	5.3%
2013	124	5	4.0%
2014	104	7	6.7%
2015	99	5	5.1%
2016	101	5	5.0%
2017	108	6	5.6%
2018	81	1	1.2%
Total	5,570	338	6.1%

This chart shows that the percentage of large loss claims per year seems to have declined somewhat in recent Report Years. This may be a function of older claims having had more time to develop than newer claims, but it may also reflect the fact that sites with “legacy pollution” are declining in number. Note that this chart does not include incident reports in the total number of claims.

In addition, the following breakdown shows the anticipated large losses and average lag time to identification of the claims as large by claim type:

Missouri Petroleum Storage Tank Insurance Fund Large Losses by Claim Type as of June 30, 2018				
Claim Type	Total Claims	Large Claims	Percent Large	Average Lag
Insurance UST - Release	287	34	11.8%	60
Insurance UST - Closure	1,594	59	3.7%	87
Insurance UST - Other	572	52	9.1%	105
Remedial UST	2,562	131	5.1%	113
Insurance AST	287	49	17.1%	72
Remedial AST	268	13	4.9%	104
Total	5,570	338	6.1%	96

The percentages in the above chart do not necessarily reflect the true risk that a claim may become large over time. For instance, Remedial UST claims make up the largest category of large claims but one of the smallest categories by percentage. This may partly be a reflection of the fact that many such sites had already been partly remediated before the PSTIF began issuing payments. As a result, the percentage may understate the true riskiness by claim type going forward.

It is anticipated that remediations associated with tank closures (“Insurance UST – Closure”) will continue to show relatively low risk of becoming large claims. Newer sites without legacy pollution and for which leak prevention has always been used will tend to have less catastrophic releases (if any) that went undetected. Therefore, tank closures at such sites are unlikely to lead to discovery of large losses. By contrast, many older sites with legacy pollution issues have already undergone remediation efforts since the PSTIF became active. Therefore, tank closures at those sites may be less likely to result in large losses because the site has already been remediated recently.

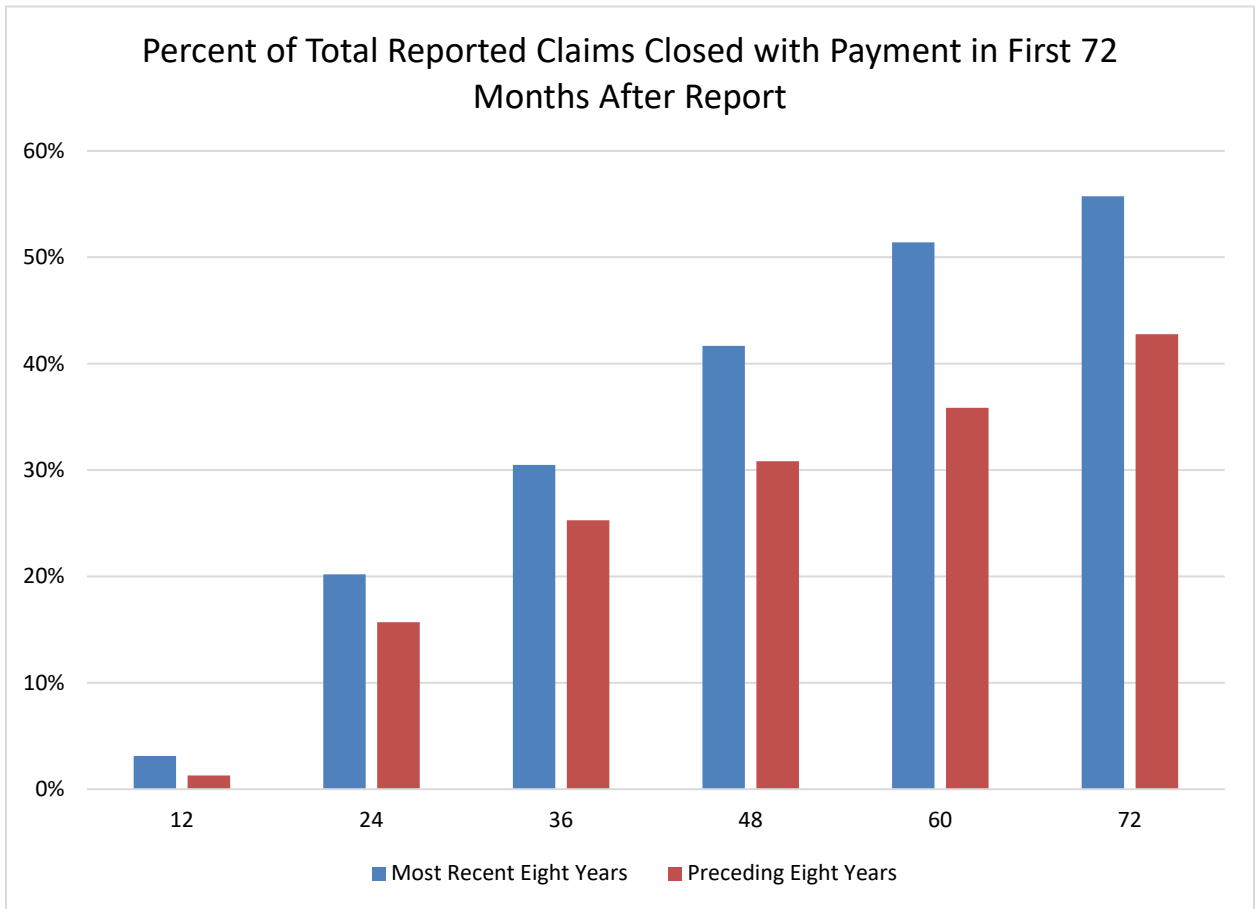
Large losses account for approximately \$159.1 million in incurred losses, or approximately 45.6% of incurred losses, despite accounting for only 6.1% of claims. These values are slightly higher than those determined at the time of the previous analysis.

Settlement Speed

The Board's staff has undertaken significant efforts to improve the speed with which claims come to closure in recent years. However, because such changes are always incremental in nature, it often takes a long time to see them borne out in data.

This year, Taylor & Mulder reviewed the rate at which claims are closed. It is our conclusion that claim closure rates for newly reported claims have generally improved.

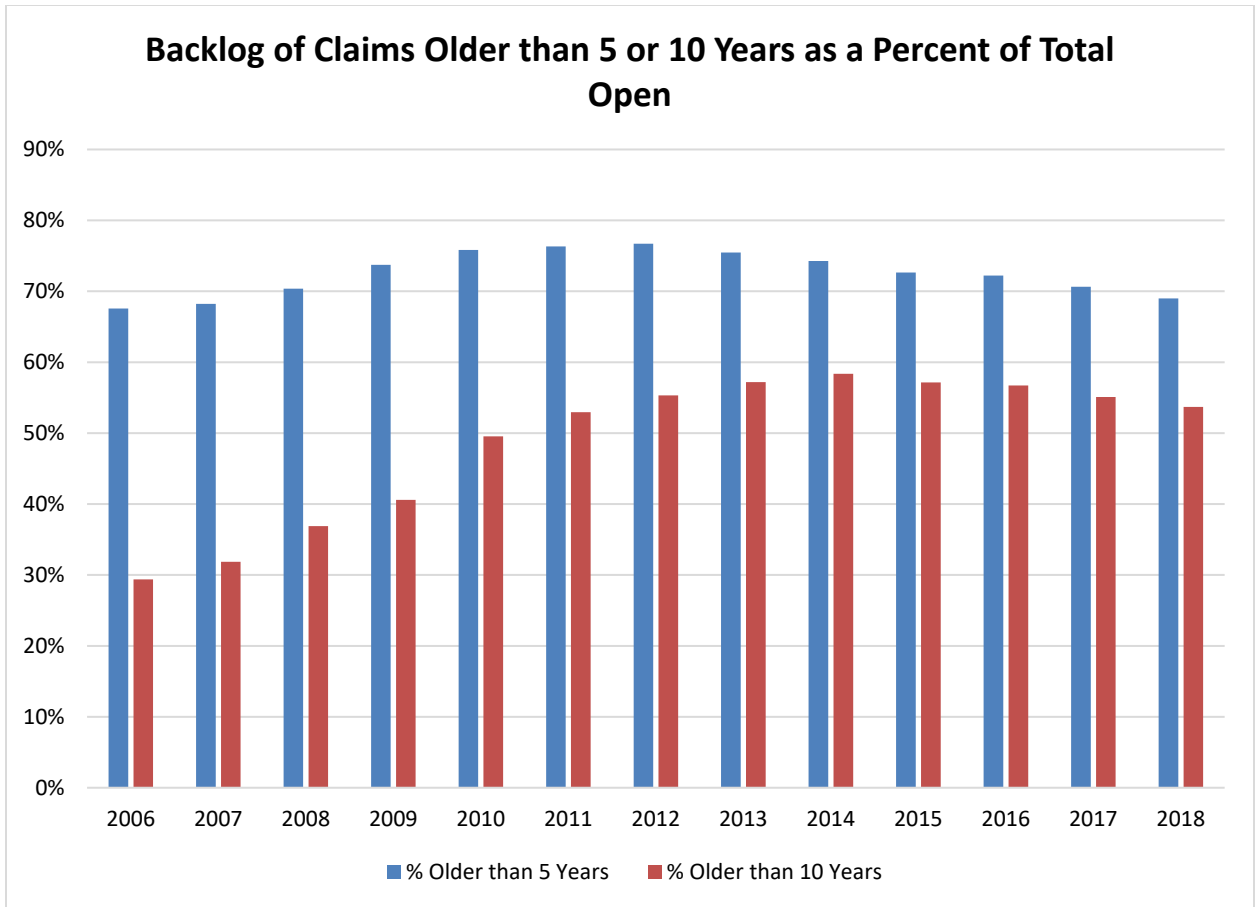
When excluding claims that have been closed without payment, rates of claim closure have been generally higher in the most recent eight years. The following chart shows the percent of claims closed at each maturity for the first 72 months for the most recent eight calendar years (2011 – 2018) and for the preceding eight years (2003 – 2010):



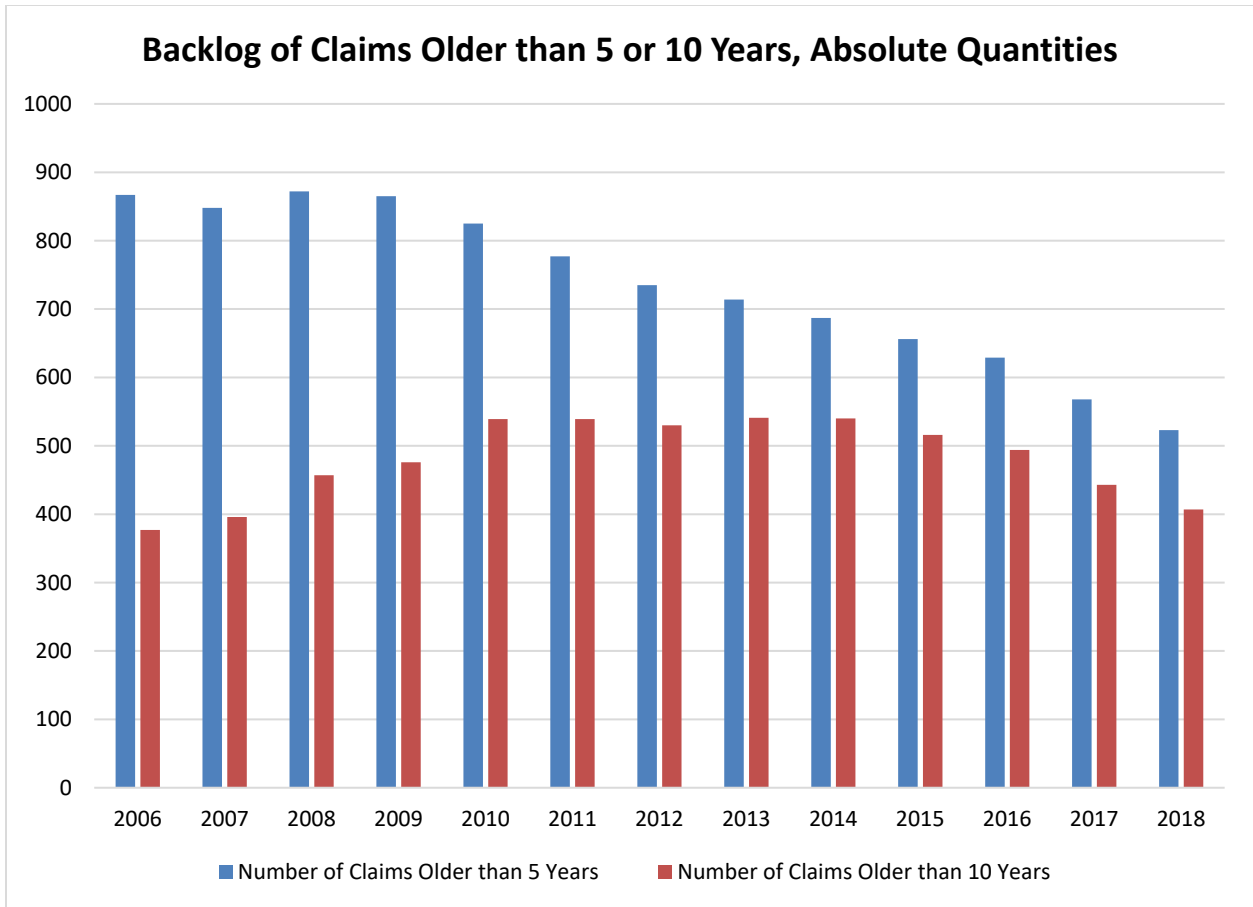
This chart shows that in the most recent eight fiscal years, the percentage of claims closed at each age is significantly higher than for the preceding eight fiscal years.

This pattern is also borne out when looking at all open claims in each fiscal year. In the most recent eight fiscal years, an average 11.8% of open claims have been closed with payment each year. In the preceding eight years, 9.6% of open claims were closed with payment each year on average. These patterns imply that relatively new claims are being closed more quickly now than in the past.

Throughout the early 2000s and into the 2010s, there was a growing backlog of older claims. In recent years, this trend has begun to reverse, with old claims representing a declining proportion of total claims:



This trend is more readily apparent in terms of the absolute number of old claims:



As this graph shows, the absolute number of claims older than 10 years has been declining steadily since 2014, while the number of claims older than 5 years has been declining steadily since 2008.

Recommendations

1. Anticipated Cost of Selling Book

If it is determined that the PSTIF will sunset on December 31, 2025, the remaining open claims will need to be remediated. This will mean incurring overhead expenses of a shrinking book of liabilities over a long period of time at cost to tax payers.

One option for reducing the burden on tax payers would be to sell the book of liabilities to the private market following fund sunset. This would mean paying a private insurance provider a sum of money

in exchange for transferring the responsibility for remediating those claims to the provider. This would effectively extinguish the liabilities for the State of Missouri. Depending on the loss adjustment expenses incurred by the private insurer in handling claims, such an arrangement could lead to remediation of the claims at a decreased cost. It should be noted that there are also potentially significant disadvantages with such a sale that should be weighed heavily before proceeding.

If it is deemed to be potentially in the interest of the State, we would recommend that the PSTIF carry out a study to determine the anticipated costs, advantages, and disadvantages of selling the book of liabilities to the private insurance market following sunset of the fund.

Report Distribution and Use

This report has been prepared for internal use by the management of PSTIF, their accountants, auditors, and attorneys. This report may be reproduced only in its entirety. The Exhibits and Appendices are integral parts of this report. Other distribution or use of this report by the PSTIF management or related parties described above is not authorized without the prior written permission of Taylor & Mulder, Incorporated. The PSTIF is not authorized to include this report in any marketing or request for proposal solicitations. In addition, it should be understood that T&M consultants are available to respond to any questions by authorized third parties with respect to this report.

Conditions and Limitations

The analyses contained in this report were performed using accepted loss and loss adjustment expense reserving methods adjusted to the special needs of the PSTIF and in conformance with sound actuarial standards and principles. T&M introduced assumptions and judgments that we considered appropriate in the circumstances.

With regard to projections of ultimate values, it should be understood that the emergence and settlement of claims are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future ultimate losses and loss expenses are inherently uncertain because of the random nature of claims occurrences. They are also dependent upon future contingent events and are affected by many additional factors.

PSTIF claim reserving procedures and settlement philosophy, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the PSTIF, improvements in technology, and many other economic, legal, political, legislative and social factors all can have significant effects on ultimate claim costs. Therefore, we cannot warrant that actual developments will not differ from current projections. Such differences could be upward or downward and could be significant.

In summary, the ultimate loss and loss adjustment expense levels estimated in this report are subject to potential variations in estimation due to:

- (1) the fact that the ultimate liability of PSTIF is subject to the outcome of events yet to occur;
- (2) the unanticipated changes in the legal, economic, legislative or claims adjudication environments;
- (3) statistical fluctuation in losses around the estimated or expected values when all other factors remain constant; and
- (4) the fact that the actual future loss and loss payment and reporting patterns may differ from those applied in the determination of the expected losses or there may be unanticipated changes in the loss and expense loss and expense payment and reporting patterns;

Accordingly, no assurance can be given that future loss emergence will not deviate from the estimated ultimate loss and loss adjustment expenses. However, the ultimate loss and loss adjustment expense

estimates were based on a reasonable application of generally accepted actuarial procedures and techniques applied to the information available.

We reviewed the information for overall reasonableness and presented any irregularities to the PSTIF third-party administrator for edification and clarification.

T&M relied without audit or verification on historical loss, loss adjustment expense, exposure data, and other information provided by the PSTIF and its employees. T&M has relied upon the data provided and on the oral and/or written statements made regarding the quality, accuracy, and completeness of the data and information supplied. Any inaccuracies or inconsistencies in the data could have a significant effect on the conclusions drawn.

Should any inaccuracies be found in the data, T&M should be notified immediately so that the analysis can be adjusted accordingly.

With regard to projections of estimated revenues, it should be understood that the revenue streams are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future revenues are inherently uncertain due to potential changes in technology, the implementation of environmental requirements, the introduction of alternative vehicle fuels, and changes in the economy among others. While T&M has used its best judgment in selecting trend values for each category of revenue, actual revenue collected is dependent upon unknown future events and may be affected by additional factors outside of PSTIF control.

T&M reflected anticipated investment income in the reserves assuming a 0.67% annual rate of return on investments. We did not independently verify the ability of the PSTIF to match this assumed rate.

The analysis in this report was limited to the loss and loss adjustment expense items noted in the scope of this project. This report does not include an examination of the assets of the PSTIF, nor did we form any opinion as to the value or validity of the assets. This report does not include a review or analysis of any income statement or other balance sheet items. This analysis with respect to loss and loss adjustment expense reserves is based upon the assumption that all reserves are backed by valid assets and that these assets reflect suitably scheduled maturities and/or sufficient liquidity to meet cash flow requirements.

This report is limited in scope to the estimate of the level of reserve adequacy at the evaluation date of the report. It also includes projections regarding cash flow of the operations of the PSTIF under certain narrow assumptions and conditions.

This report was prepared for use by persons technically competent in insurance financial matters. Persons receiving this report should be made aware of the availability of T&M, Inc. personnel to answer questions and/or amplify on any matter addressed therein.

Actuarial Analysis

Sources of Data

Data was provided by Ms. Carol Eighmey with the PSTIF and Ms. Dorcee Lauen with Williams & Company Consulting, Inc., PSTIF's third-party administrator, in the form of several files. A full description of the names and contents of these files may be found as an appendix at the end of this report. In addition, we received additional information from interviews with PSTIF management and Williams' personnel, as well as from the PSTIF website, www.pstif.org.

Overall Methodology

Selection of Factors

In each of the methods described below, our selections of development factors were based on the evaluation of the predictive value of the various historical averages and the perceived presence or absence of trends and singularities. Apparent statistical aberrations were eliminated either judgmentally or by selecting a longer experience period to increase the credibility of the experience, whichever we believed more appropriate in the particular circumstances.

Paid Development Method

The paid development method uses historical loss payment patterns to project actual payments as of a given valuation date to ultimate. The PSTIF's historical payment patterns or the fitted loss development factors were relied upon in selecting the expected payment patterns at each evaluation. The difference between the projected ultimate losses and the losses and allocated loss adjustment expenses paid through the evaluation date is the estimated reserve as of the evaluation date.

Estimates produced using the paid development method are not affected by changes in the case reserve position of the PSTIF which might have occurred during the review period, but may be understated since they ignore large unpaid claims. Also, this method may be susceptible to any changes in case settlement philosophy and/or speed of payment.

Incurred Development Method

The incurred, or reported, development method is similar to the paid development method and uses historical reporting patterns to project actual reported amounts (excluding IBNR) as of a given evaluation date to ultimate. The difference between the projected ultimate losses and the losses paid through the evaluation date is the estimated reserve as of the evaluation date.

In many situations, the incurred development method is preferred over the paid method since large open but unpaid claims are considered. This method is more responsive to changes in the external business environment, since changes in liability laws, legislative changes affecting the PSTIF, court decisions and other external factors are generally reflected in the case reserves as soon as claims management becomes aware of them. As a result, the incurred loss development factors at each stage of development tend to be lower, and more stable, than those of the corresponding paid development method. However, the incurred development method may be affected by changes in case reserving practices over time and, to a lesser extent, also may be affected by changes in claims settlement rates.

Bornhuetter-Ferguson Methods

Loss development methods may be affected by changes in the reporting and payment of claims. Random fluctuations in the reporting and payment of claims (such as may result from a single unusually large claim) are magnified by the development factors, potentially resulting in biased estimates and wide changes in the estimates from one evaluation to the next. To minimize such

fluctuations, we applied the Bornhuetter-Ferguson method to incurred losses and to paid losses. The Bornhuetter-Ferguson method is particularly suited for projecting loss reserves for longer-tailed business with volatile or limited development patterns. The Bornhuetter-Ferguson method represents a compromise between traditional loss development methods such as the incurred and paid loss development methods and an expected loss ratio method.

For the incurred Bornhuetter-Ferguson method, initial expected losses are established for each accident year to be consistent with projected pure premium amounts, i.e. projected losses divided by an exposure base (in this case, insured tanks in-force for insurance claims or remaining potential remediation sites for remedial claims). These initial expected losses are then split into two components: expected reported losses and expected unreported losses. The expected unreported losses, which comprise the IBNR and bulk reserves for each accident year, are calculated as a function of the earned premium, the initial expected loss ratio, and the expected portion of ultimate losses that remains unreported or unreserved as of the evaluation date.

For the paid Bornhuetter-Ferguson method, initial expected losses are also derived from projected pure premium amounts. These initial expected losses are then split into two components: expected paid losses and expected unpaid losses. The expected unpaid losses, which comprise the IBNR and case reserves for each accident year, are calculated as a function of the initial expected loss ratio, the initial expected ultimate losses, and the expected portion of ultimate losses that remains unpaid as of the evaluation date.

Projection Methodologies for Cash Flow Analysis

Several overlapping projection methodologies were used to perform the cash flow analysis. First, regression techniques were used to project claim frequency and severity into future periods. These projections were then converted into parameters for a simulation model.

The simulation model used a Poisson distribution to predict the number of claims of each category for each Report Year. For each predicted claim, a lognormal distribution was then generated as the prediction of the ultimate size of that claim. For example, one trial of the simulation might predict that there would be 10 UST Insurance (Release) claims in a given Report Year. Each of those 10 claims would have a simulated claim size drawn from the lognormal distribution.

Repeating this process 10,000 times for each claim type and for each Report Year from 2018 to 2026, we obtained a set of potential ultimate losses that represent a probability distribution of outcomes, where more common answers represent more likely outcomes.

Historical losses were simulated using incurred loss development triangles. For each triangle, the loss development factors were simulated using normal distributions for each development period. The mean for each development period was selected to be the actuarial central estimate, while the standard deviation was selected to be the standard deviation of the historical LDFs.

For both historical and future claims, anticipated future payments by fiscal year were determined by applying fixed projected payment patterns to unpaid losses to determine the anticipated timing of future payments.

Combining these projections, we obtained an estimate of the range of possibilities for loss payments over time. We compared these loss payment projections to revenue projections to obtain an estimate of the range of possible outcomes for cash flows over time.

Methodology by Claim Type

Long-tailed lines of business have some important properties. These are lines of business for which claim payments can extend over a very long period (10 years or more) before closure. As claim payments are made over a long time horizon, the first few years after a claim is reported may have little or no actual claim payments. This produces relatively low paid losses at early maturities, and as a result, payment patterns can be strongly affected by small random fluctuations in payments from year to year.

The long payment pattern has a substantial effect on most categories of PSTIF claims. Paid losses at early maturities have shown extreme volatility, and as a result, paid losses have very low credibility (i.e., statistical stability) for some categories of claims.

By contrast, incurred losses have shown greater stability. When a claim is reported to the PSTIF, a reserve is established based on the expected ultimate loss for the claim. As the claim matures and losses are paid out, the incurred loss may be increased or decreased commensurate with the adjuster's interpretation of the ultimate value of the claim. In this case, the first estimate by the adjusters is close enough to the ultimate loss that development is low when compared to paid losses. Because development patterns for incurred losses were more stable over time, incurred loss development methods received greater relative weight in our analysis.

Incurred loss development, by contrast, is stable. Incurred losses do not undergo the same extreme changes as paid losses, making estimates from incurred losses more credible. In some cases, incurred loss

development is modestly negative, implying that early reserve estimates are slightly over-stated. However, these trends seem to reverse at later maturities, returning incurred losses on average to slightly higher than the initial reserves as of 12 months.

When relatively little credibility could be placed in the loss development patterns observed in paid or incurred losses, higher reliance was placed on the Bornhuetter-Ferguson methods. These methods produce estimates that are not as significantly influenced by random variations in claim payout or reporting speeds, but are highly stable from year to year and are a reflection of the overall level of exposure.

Selections of Ultimate Losses

Generally, the selection of ultimate losses was based on selecting incurred loss development method for older years, as this method seemed to give the best result. In years where there was great variability, particularly more recent Report Years, we selected a combination of methods (including the Bornhuetter-Ferguson method) to provide greater stability in results.

Any exceptions to the above description were based on our review of the methods combined with our knowledge of specific accident years and other considerations as described in the background section of our report.

Loss Reserve Discounting

T&M reflected anticipated investment income on reserves using an assumed discount rate of 1.64%. This rate was based on historical yields by the State as of June 30, 2018. We did not independently verify the ability of the PSTIF to match these rates at June 30, 2018.

The undiscounted reserves and the discounted reserves are shown in the summary section of our report. The future payout of the undiscounted recommended reserve from 2019 to 2027 separately and for years subsequent to fiscal year 2027 on a combined basis is also provided in this section.

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Executive Summary - Unpaid Losses & ALAE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Case		Unpaid	Undiscounted		Discounted
<u>Claim Type</u>	<u>Reserve</u>	<u>IBNR</u>	<u>ALAE</u>	<u>Unpaid</u> <u>Loss & ALAE</u>	<u>Discount</u>	<u>Unpaid</u> <u>Loss & ALAE</u>
Insurance UST - Release	6,665,892	5,200,853	77,890	11,944,635	1,032,534	10,912,100
Insurance UST - Closure	10,796,300	4,805,357	102,405	15,704,062	1,331,170	14,372,892
Insurance UST - Other	6,608,138	9,118,534	103,225	15,829,897	1,327,386	14,502,511
Remedial UST	19,415,970	4,393,197	156,277	23,965,443	2,018,303	21,947,140
Insurance AST	10,296,657	3,182,016	88,470	13,567,144	1,378,006	12,189,138
Remedial AST	2,310,237	677,910	19,613	3,007,760	239,399	2,768,360
Total	56,093,194	27,377,866	547,880	84,018,940	7,326,799	76,692,141

Notes:

Col (5) = (2) + (3) + (4)

Col (7) = (5) - (6)

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	4,163,102	4,160,404	-	-	4,160,404
1995	4,335,032	4,239,252	-	-	4,239,252
1996	75,352,560	75,770,566	-	-	75,770,566
1997	19,472,810	19,132,155	-	-	19,132,155
1998	29,828,357	30,064,675	-	-	30,064,675
1999	25,367,291	24,884,392	-	-	25,009,641
2000	33,484,020	33,675,402	-	-	33,469,166
2001	16,222,819	16,300,995	-	-	16,300,995
2002	15,948,498	16,128,021	-	-	16,128,021
2003	12,334,598	12,537,636	-	-	12,578,354
2004	16,045,459	15,787,090	-	-	15,993,088
2005	11,526,892	11,680,003	-	-	11,576,575
2006	8,169,477	8,238,733	-	-	8,251,423
2007	11,395,779	10,716,946	-	-	10,903,702
2008	9,796,092	9,551,486	9,409,801	9,350,404	9,259,060
2009	7,558,968	7,036,582	7,674,241	7,264,321	7,136,497
2010	4,311,342	4,488,007	5,835,775	5,291,335	4,424,114
2011	9,518,415	9,774,258	9,205,405	9,577,042	9,127,697
2012	9,120,396	9,140,527	9,455,067	9,448,384	8,789,291
2013	9,195,617	8,347,207	9,576,330	8,913,217	8,241,239
2014	7,815,879	8,281,940	8,841,533	8,979,961	7,657,218
2015	12,074,087	11,383,554	10,850,025	10,291,908	9,806,359
2016	8,440,995	9,194,444	9,538,479	9,515,728	8,667,342
2017	12,245,321	12,719,379	10,751,784	11,998,766	11,182,955
2018	7,108,271	8,272,270	10,282,951	9,980,706	7,993,546
TOTAL	380,832,077	381,505,924	101,421,392	100,611,773	375,863,334

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>	<u>PAID</u> <u>ALAE</u>	<u>UNPAID</u> <u>ALAE</u>	<u>ULTIMATE</u> <u>ALAE</u>	<u>ULTIMATE</u> <u>LOSS & ALAE</u>	<u>UNPAID</u> <u>LOSS & ALAE</u>
1994	4,160,404	3,840,951	4,145,291	304,340	15,113	319,453	6,407	2,097	8,504	4,168,908	321,550
1995	4,239,252	4,157,462	4,210,487	53,025	28,766	81,791	9,365	537	9,902	4,249,154	82,327
1996	75,770,566	68,084,197	75,063,252	6,979,055	707,314	7,686,369	129,990	50,451	180,441	75,951,008	7,736,820
1997	19,132,155	18,082,067	19,005,008	922,940	127,147	1,050,088	42,182	6,892	49,075	19,181,230	1,056,980
1998	30,064,675	26,735,480	29,800,864	3,065,383	263,811	3,329,195	82,848	21,852	104,700	30,169,375	3,351,047
1999	25,009,641	23,225,460	24,699,219	1,473,758	310,423	1,784,181	75,330	11,711	87,041	25,096,682	1,795,892
2000	33,469,166	28,362,415	33,273,137	4,910,722	196,029	5,106,751	84,218	33,519	117,737	33,586,903	5,140,270
2001	16,300,995	13,112,484	16,154,987	3,042,503	146,008	3,188,511	52,749	20,928	73,677	16,374,672	3,209,440
2002	16,128,021	13,376,817	15,531,007	2,154,190	597,014	2,751,204	47,655	18,058	65,713	16,193,734	2,769,262
2003	12,578,354	10,229,919	11,995,739	1,765,819	582,616	2,348,435	54,630	15,414	70,045	12,648,399	2,363,849
2004	15,993,088	13,177,394	14,728,992	1,551,598	1,264,097	2,815,695	136,523	18,481	155,004	16,148,093	2,834,176
2005	11,576,575	8,915,837	10,825,449	1,909,612	751,126	2,660,738	108,280	17,464	125,744	11,702,320	2,678,203
2006	8,251,423	6,204,347	7,468,420	1,264,072	783,003	2,047,076	62,866	13,436	76,303	8,327,726	2,060,512
2007	10,903,702	8,801,198	9,648,495	847,297	1,255,207	2,102,504	97,508	13,800	111,308	11,015,010	2,116,304
2008	9,259,060	7,161,589	8,338,369	1,176,780	920,691	2,097,471	38,915	13,767	52,682	9,311,742	2,111,238
2009	7,136,497	5,060,502	6,136,229	1,075,727	1,000,268	2,075,995	29,082	13,626	42,708	7,179,205	2,089,621
2010	4,424,114	2,829,476	3,979,800	1,150,325	444,313	1,594,638	27,591	10,467	38,058	4,462,171	1,605,105
2011	9,127,697	5,679,153	7,877,099	2,197,946	1,250,597	3,448,544	30,898	22,635	53,534	9,181,230	3,471,179
2012	8,789,291	5,411,516	7,504,463	2,092,946	1,284,828	3,377,774	31,513	22,171	53,684	8,842,975	3,399,945
2013	8,241,239	5,023,032	6,619,698	1,596,666	1,621,540	3,218,207	27,062	21,123	48,186	8,289,424	3,239,330
2014	7,657,218	3,660,548	6,304,334	2,643,786	1,352,884	3,996,671	24,530	26,233	50,763	7,707,981	4,022,904
2015	9,806,359	4,973,053	7,177,048	2,203,996	2,629,310	4,833,306	40,547	31,724	72,272	9,878,631	4,865,030
2016	8,667,342	2,867,384	6,043,788	3,176,403	2,623,554	5,799,957	17,550	38,069	55,619	8,722,960	5,838,027
2017	11,182,955	2,939,088	8,012,948	5,073,860	3,170,007	8,243,867	23,550	54,110	77,660	11,260,615	8,297,978
2018	7,993,546	480,906	3,941,348	3,460,441	4,052,198	7,512,639	11,259	49,311	60,570	8,054,116	7,561,950
TOTAL	375,863,334	292,392,274	348,485,468	56,093,194	27,377,866	83,471,060	1,293,047	547,880	1,840,928	377,704,262	84,018,940

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(6)
RY	PAID LDM ULTIMATE	INC LDM ULTIMATE	PAID BF ULTIMATE	INC BF ULTIMATE	SELECTED ULTIMATE
1994	246,661	246,661	-	-	246,661
1995	241,953	241,953	-	-	241,953
1996	1,579,163	1,579,163	-	-	1,579,163
1997	1,995,927	1,995,927	-	-	1,995,927
1998	1,381,308	1,381,308	-	-	1,381,308
1999	142,573	142,573	-	-	142,573
2000	2,219,267	2,219,267	-	-	2,219,267
2001	1,081,236	1,084,938	-	-	1,084,938
2002	719,666	727,076	-	-	727,076
2003	2,190,077	2,242,938	-	-	2,242,938
2004	1,353,628	1,420,364	-	-	1,420,364
2005	1,160,547	1,246,652	-	-	1,246,652
2006	213,084	234,210	-	-	234,210
2007	2,961,629	2,870,172	-	-	2,870,172
2008	2,365,876	2,365,525	2,171,186	2,261,316	2,171,186
2009	1,240,247	1,445,591	1,189,496	1,474,520	1,337,464
2010	368,719	378,102	812,183	593,254	378,102
2011	2,859,924	2,611,670	2,455,816	2,436,639	2,436,639
2012	1,130,634	1,194,538	1,422,705	1,348,644	1,130,634
2013	294,002	325,579	1,023,163	787,717	309,791
2014	2,272,090	2,346,383	2,125,274	2,229,120	2,125,274
2015	3,703,062	3,727,382	2,748,311	3,079,865	2,914,088
2016	1,253,068	1,732,453	1,819,278	1,903,102	1,492,761
2017	3,540,070	2,874,069	2,521,667	2,546,704	2,534,186
2018	849,434	930,100	2,267,346	1,832,816	1,204,117
TOTAL	37,363,846	37,564,595	20,556,424	20,493,696	35,667,443

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	246,661	246,661	246,661	-	-	-
1995	241,953	241,953	241,953	-	-	-
1996	1,579,163	1,155,906	1,579,163	423,257	-	423,257
1997	1,995,927	1,995,927	1,995,927	-	-	-
1998	1,381,308	1,296,308	1,381,308	85,000	-	85,000
1999	142,573	142,573	142,573	-	-	-
2000	2,219,267	1,724,971	2,219,267	494,297	-	494,297
2001	1,084,938	996,294	1,081,236	84,942	3,703	88,644
2002	727,076	616,509	719,666	103,156	7,410	110,567
2003	2,242,938	1,645,324	2,190,077	544,753	52,861	597,614
2004	1,420,364	1,094,026	1,353,628	259,602	66,736	326,338
2005	1,246,652	844,136	1,160,547	316,412	86,105	402,517
2006	234,210	140,820	213,084	72,264	21,126	93,390
2007	2,870,172	2,297,257	2,488,778	191,520	381,394	572,914
2008	2,171,186	1,780,630	2,052,177	271,547	119,009	390,555
2009	1,337,464	743,523	1,240,247	496,725	97,216	593,941
2010	378,102	245,727	316,478	70,751	61,625	132,375
2011	2,436,639	1,793,765	2,064,707	270,942	371,932	642,874
2012	1,130,634	673,028	914,659	241,631	215,975	457,606
2013	309,791	162,643	231,563	68,921	78,228	147,148
2014	2,125,274	1,088,861	1,573,979	485,118	551,295	1,036,413
2015	2,914,088	1,569,832	2,292,174	722,342	621,913	1,344,256
2016	1,492,761	435,421	971,174	535,753	521,586	1,057,340
2017	2,534,186	851,011	1,479,562	628,551	1,054,624	1,683,175
2018	1,204,117	17,593	316,002	298,409	888,115	1,186,523
TOTAL	35,667,443	23,800,698	30,466,590	6,665,892	5,200,853	11,866,745

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(6)
RY	PAID LDM ULTIMATE	INC LDM ULTIMATE	PAID BF ULTIMATE	INC BF ULTIMATE	SELECTED ULTIMATE
1994	875,960	875,960	-	-	875,960
1995	830,629	830,629	-	-	830,629
1996	3,961,729	3,883,098	-	-	3,883,098
1997	4,642,882	4,642,882	-	-	4,642,882
1998	5,363,065	5,363,065	-	-	5,363,065
1999	9,777,667	9,576,992	-	-	9,576,992
2000	5,728,071	5,715,439	-	-	5,715,439
2001	2,323,281	2,277,058	-	-	2,277,058
2002	4,676,253	4,486,171	-	-	4,486,171
2003	3,471,849	3,454,424	-	-	3,454,424
2004	2,448,871	2,399,803	-	-	2,399,803
2005	2,727,699	2,786,378	-	-	2,786,378
2006	1,568,383	1,634,727	-	-	1,634,727
2007	4,243,288	4,003,475	-	-	4,003,475
2008	3,068,621	3,195,561	2,975,158	3,153,957	3,132,091
2009	2,385,549	2,172,775	2,444,943	2,204,569	2,279,162
2010	1,950,285	2,032,235	2,133,940	2,092,052	1,991,260
2011	2,059,681	1,813,826	2,236,988	1,909,569	1,813,826
2012	2,966,883	3,282,856	2,870,611	3,210,771	3,124,869
2013	3,947,335	3,702,844	3,487,829	3,558,188	3,523,009
2014	3,016,161	3,396,279	2,876,578	3,282,989	2,946,370
2015	3,040,122	2,419,470	2,850,359	2,463,640	2,441,555
2016	2,304,864	2,514,485	2,510,010	2,546,208	2,409,675
2017	2,543,316	2,859,618	2,630,388	2,803,987	2,586,852
2018	2,245,872	2,375,350	2,650,471	2,545,494	2,245,872
TOTAL	82,168,319	81,695,400	29,667,275	29,771,424	80,424,642

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	875,960	731,314	875,960	144,646	-	144,646
1995	830,629	830,629	830,629	-	-	-
1996	3,883,098	3,847,779	3,883,098	35,320	-	35,320
1997	4,642,882	4,402,894	4,642,882	239,988	-	239,988
1998	5,363,065	5,023,106	5,363,065	339,959	-	339,959
1999	9,576,992	9,232,961	9,576,992	344,031	-	344,031
2000	5,715,439	5,331,739	5,687,601	355,862	27,838	383,700
2001	2,277,058	2,128,279	2,255,449	127,170	21,609	148,779
2002	4,486,171	4,208,501	4,388,828	180,327	97,343	277,670
2003	3,454,424	3,063,698	3,379,908	316,210	74,515	390,725
2004	2,399,803	2,113,648	2,304,758	191,110	95,046	286,156
2005	2,786,378	2,309,907	2,667,437	357,530	118,941	476,472
2006	1,634,727	1,243,210	1,568,383	325,173	66,344	391,517
2007	4,003,475	3,449,564	3,753,895	304,331	249,580	553,912
2008	3,132,091	2,441,800	2,968,102	526,301	163,989	690,291
2009	2,279,162	1,818,009	2,023,386	205,377	255,776	461,153
2010	1,991,260	1,416,703	1,825,960	409,256	165,300	574,557
2011	1,813,826	1,439,764	1,605,837	166,073	207,989	374,062
2012	3,124,869	2,007,539	2,897,254	889,715	227,615	1,117,330
2013	3,523,009	2,514,517	3,178,441	663,925	344,567	1,008,492
2014	2,946,370	1,774,763	2,861,330	1,086,567	85,039	1,171,607
2015	2,441,555	1,527,986	1,972,587	444,600	468,968	913,569
2016	2,409,675	984,252	1,977,045	992,792	432,630	1,425,422
2017	2,586,852	768,576	2,028,988	1,260,412	557,864	1,818,276
2018	2,245,872	211,847	1,101,470	889,623	1,144,402	2,034,025
TOTAL	80,424,642	64,822,984	75,619,285	10,796,300	4,805,357	15,601,657

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(6)
RY	PAID LDM ULTIMATE	INC LDM ULTIMATE	PAID BF ULTIMATE	INC BF ULTIMATE	SELECTED ULTIMATE
1994	3,040,481	3,037,783	-	-	3,037,783
1995	3,041,597	2,945,818	-	-	2,945,818
1996	2,344,436	2,380,279	-	-	2,380,279
1997	3,877,360	3,783,030	-	-	3,783,030
1998	2,971,774	3,055,366	-	-	3,055,366
1999	2,879,192	2,848,305	-	-	2,848,305
2000	3,976,297	3,974,075	-	-	3,974,075
2001	1,107,092	1,164,580	-	-	1,164,580
2002	4,548,061	4,798,581	-	-	4,798,581
2003	3,372,756	3,576,030	-	-	3,576,030
2004	5,079,848	4,880,095	-	-	4,880,095
2005	2,219,551	2,312,716	-	-	2,219,551
2006	3,687,158	3,623,565	-	-	3,623,565
2007	1,114,898	1,062,164	-	-	1,062,164
2008	2,590,150	2,589,298	2,361,753	2,448,733	2,497,484
2009	1,517,751	1,227,996	1,680,659	1,394,911	1,311,453
2010	379,769	313,423	1,048,687	767,613	346,596
2011	1,497,560	2,180,272	1,644,865	2,104,893	1,856,897
2012	1,299,056	1,363,947	1,646,834	1,573,131	1,331,501
2013	1,963,414	1,643,996	1,963,432	1,771,263	1,643,996
2014	516,203	584,328	1,473,223	1,206,369	550,266
2015	3,797,701	3,674,600	2,709,518	2,778,967	2,744,243
2016	1,840,713	1,936,816	1,927,981	1,944,359	1,840,713
2017	1,569,257	1,921,916	1,904,911	1,940,937	1,745,586
2018	921,715	755,270	1,944,204	1,652,751	838,492
TOTAL	61,153,791	61,634,249	20,306,068	19,583,927	60,056,450

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	3,037,783	2,862,976	3,022,670	159,693	15,113	174,807
1995	2,945,818	2,864,027	2,917,052	53,025	28,766	81,791
1996	2,380,279	2,154,274	2,344,436	190,161	35,843	226,005
1997	3,783,030	3,626,458	3,703,945	77,487	79,085	156,573
1998	3,055,366	2,510,541	2,971,774	461,233	83,592	544,825
1999	2,848,305	2,650,903	2,750,103	99,201	98,202	197,402
2000	3,974,075	3,605,836	3,805,884	200,048	168,191	368,239
2001	1,164,580	928,198	1,107,092	178,894	57,488	236,381
2002	4,798,581	3,881,563	4,459,410	577,848	339,170	917,018
2003	3,576,030	2,817,658	3,223,096	405,438	352,934	758,372
2004	4,880,095	4,112,757	4,327,913	215,156	552,182	767,338
2005	2,219,551	1,731,576	1,963,983	232,407	255,568	487,975
2006	3,623,565	2,764,255	3,014,915	250,659	608,651	859,310
2007	1,062,164	785,680	867,453	81,773	194,711	276,484
2008	2,497,484	1,717,896	2,051,978	334,082	445,506	779,588
2009	1,311,453	917,398	935,849	18,451	375,604	394,055
2010	346,596	214,795	224,795	10,000	121,801	131,801
2011	1,856,897	724,726	1,497,560	772,834	359,338	1,132,172
2012	1,331,501	609,736	880,779	271,044	450,722	721,766
2013	1,643,996	799,890	989,033	189,143	654,963	844,106
2014	550,266	174,091	320,154	146,063	230,112	376,175
2015	2,744,243	1,282,058	1,769,881	487,823	974,361	1,462,185
2016	1,840,713	369,308	818,967	449,659	1,021,746	1,471,405
2017	1,745,586	199,097	771,193	572,095	974,394	1,546,489
2018	838,492	24,083	198,003	173,920	640,489	814,410
TOTAL	60,056,450	44,329,778	50,937,916	6,608,138	9,118,534	15,726,672

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Summary of Ultimate Losses

(1) RY	(2) PAID LDM ULTIMATE	(3) INC LDM ULTIMATE	(4) PAID BF ULTIMATE	(5) INC BF ULTIMATE	(6) SELECTED ULTIMATE
1994	-	-	-	-	-
1995	114,027	114,027	-	-	114,027
1996	67,357,776	67,818,570	-	-	67,818,570
1997	8,956,641	8,710,315	-	-	8,710,315
1998	18,971,581	19,151,801	-	-	19,151,801
1999	8,377,010	8,126,510	-	-	8,251,760
2000	14,987,967	15,194,204	-	-	14,987,967
2001	3,425,000	3,485,098	-	-	3,485,098
2002	3,382,181	3,490,517	-	-	3,490,517
2003	1,174,225	1,163,566	-	-	1,174,225
2004	2,037,947	2,167,660	-	-	2,167,660
2005	3,164,235	3,037,513	-	-	3,037,513
2006	533,938	592,007	-	-	592,007
2007	1,560,892	1,472,234	-	-	1,560,892
2008	966,979	725,305	1,021,361	774,460	725,305
2009	1,064,734	885,617	1,083,792	914,419	885,617
2010	886,809	1,024,476	954,030	1,036,246	975,390
2011	1,773,194	2,088,904	1,400,397	1,940,749	1,940,749
2012	522,057	430,973	802,755	541,498	476,515
2013	1,311,204	1,280,640	1,204,583	1,250,494	1,227,539
2014	1,193,782	938,415	1,143,612	974,293	1,018,773
2015	225,947	302,923	746,342	513,965	447,294
2016	985,060	1,214,312	1,057,101	1,180,912	1,021,080
2017	1,262,204	991,881	1,134,316	1,026,135	991,881
2018	1,347,600	1,193,420	1,107,717	1,142,432	1,147,856
TOTAL	145,582,991	145,600,888	11,656,005	11,295,603	145,400,352

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	-	-	-	-	-	-
1995	114,027	114,027	114,027	-	-	-
1996	67,818,570	60,816,782	67,147,099	6,330,317	671,471	7,001,788
1997	8,710,315	8,056,789	8,662,253	605,464	48,062	653,526
1998	19,151,801	16,792,391	18,971,581	2,179,191	180,220	2,359,410
1999	8,251,760	7,276,048	8,039,539	763,491	212,221	975,713
2000	14,987,967	12,583,946	14,987,967	2,404,021	-	2,404,021
2001	3,485,098	2,135,112	3,425,000	1,289,889	60,098	1,349,986
2002	3,490,517	2,737,830	3,340,765	602,935	149,753	752,687
2003	1,174,225	925,066	1,107,025	181,959	67,200	249,159
2004	2,167,660	1,508,295	2,037,947	529,652	129,713	659,365
2005	3,037,513	2,334,050	2,778,623	444,573	258,890	703,463
2006	592,007	300,938	533,938	233,000	58,069	291,069
2007	1,560,892	1,076,420	1,302,593	226,173	258,299	484,473
2008	725,305	615,335	634,174	18,839	91,131	109,971
2009	885,617	659,857	774,343	114,485	111,274	225,759
2010	975,390	485,492	886,809	401,317	88,581	489,899
2011	1,940,749	904,905	1,773,194	868,290	167,554	1,035,844
2012	476,515	271,398	360,480	89,082	116,036	205,117
2013	1,227,539	636,244	1,061,991	425,747	165,547	591,294
2014	1,018,773	548,829	731,229	182,400	287,544	469,944
2015	447,294	91,292	222,633	131,341	224,662	356,002
2016	1,021,080	350,684	868,811	518,127	152,270	670,396
2017	991,881	295,863	662,913	367,050	328,968	696,018
2018	1,147,856	73,595	582,223	508,627	565,634	1,074,261
TOTAL	145,400,352	121,591,186	141,007,156	19,415,970	4,393,197	23,809,166

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	-	-	-	-	-
1995	-	-	-	-	-
1996	-	-	-	-	-
1997	-	-	-	-	-
1998	478,042	478,042	-	-	478,042
1999	2,690,066	2,689,230	-	-	2,689,230
2000	1,195,793	1,195,793	-	-	1,195,793
2001	6,664,686	6,667,797	-	-	6,667,797
2002	2,382,845	2,386,183	-	-	2,386,183
2003	1,543,256	1,548,303	-	-	1,548,303
2004	3,064,971	2,865,372	-	-	3,064,971
2005	2,175,022	2,206,643	-	-	2,206,643
2006	2,166,914	2,154,225	-	-	2,166,914
2007	1,473,322	1,257,175	-	-	1,365,248
2008	752,679	609,737	774,828	620,746	681,208
2009	1,082,577	1,046,180	1,039,364	1,039,640	1,064,378
2010	725,760	739,771	802,473	744,555	732,765
2011	1,328,055	1,079,586	1,368,269	1,126,569	1,079,586
2012	3,201,767	2,868,213	2,599,672	2,709,427	2,725,771
2013	1,679,661	1,394,147	1,772,251	1,476,490	1,536,904
2014	817,642	1,016,535	1,088,243	1,207,055	1,016,535
2015	825,614	931,030	1,506,764	1,175,883	931,030
2016	2,057,290	1,796,378	2,065,817	1,855,672	1,903,113
2017	3,004,613	3,943,594	2,326,512	3,509,877	3,196,149
2018	1,743,650	3,018,130	2,112,690	2,661,107	2,383,894
TOTAL	41,054,224	41,892,064	17,456,884	18,127,021	41,020,459

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	478,042	478,042	478,042	-	-	-
1999	2,689,230	2,532,094	2,689,230	157,136	-	157,136
2000	1,195,793	1,195,793	1,195,793	-	-	-
2001	6,667,797	5,757,861	6,664,686	906,825	3,111	909,936
2002	2,386,183	1,692,921	2,382,845	689,924	3,338	693,262
2003	1,548,303	1,276,743	1,543,256	266,513	5,047	271,561
2004	3,064,971	2,645,562	2,845,405	199,843	219,566	419,409
2005	2,206,643	1,616,331	2,175,022	558,691	31,621	590,312
2006	2,166,914	1,755,125	2,138,100	382,976	28,814	411,790
2007	1,365,248	1,150,527	1,194,026	43,499	171,223	214,721
2008	681,208	554,141	580,153	26,011	101,055	127,066
2009	1,064,378	758,059	982,683	224,624	81,696	306,320
2010	732,765	466,760	725,760	259,000	7,006	266,006
2011	1,079,586	815,994	935,802	119,808	143,784	263,592
2012	2,725,771	1,849,816	2,451,291	601,475	274,480	875,954
2013	1,536,904	909,739	1,158,669	248,930	378,235	627,165
2014	1,016,535	74,003	817,642	743,639	198,893	942,532
2015	931,030	359,484	723,985	364,501	207,045	571,546
2016	1,903,113	727,719	1,407,791	680,072	495,322	1,175,394
2017	3,196,149	771,285	3,004,613	2,233,328	191,536	2,424,864
2018	2,383,894	153,788	1,743,650	1,589,862	640,244	2,230,106
TOTAL	41,020,459	27,541,785	37,838,443	10,296,657	3,182,016	13,478,673

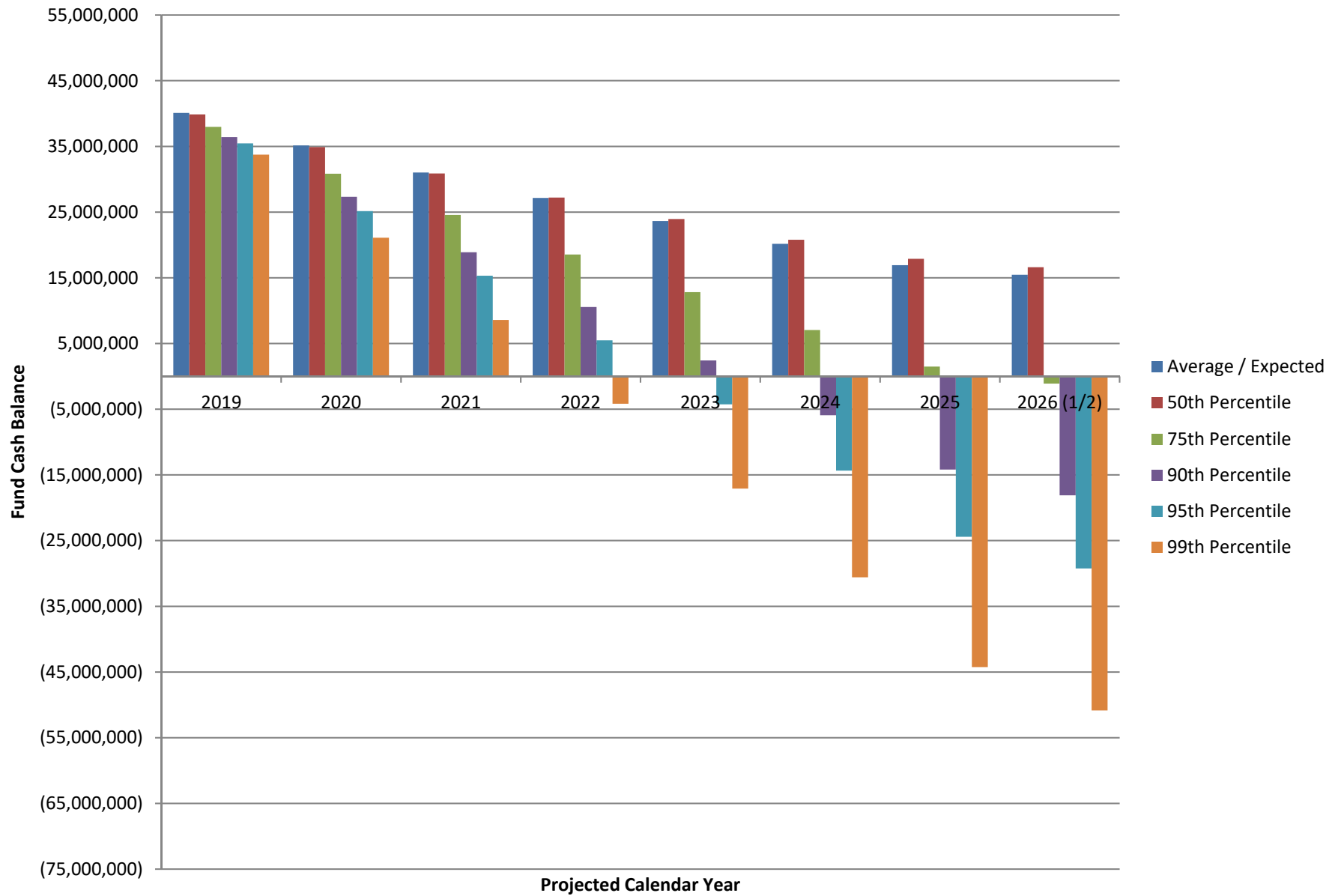
Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Summary of Ultimate Losses

(1) RY	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) PAID BF <u>ULTIMATE</u>	(5) INC BF <u>ULTIMATE</u>	(6) SELECTED <u>ULTIMATE</u>
1994	-	-	-	-	-
1995	106,826	106,826	-	-	106,826
1996	109,456	109,456	-	-	109,456
1997	-	-	-	-	-
1998	662,586	635,093	-	-	635,093
1999	1,500,783	1,500,783	-	-	1,500,783
2000	5,376,624	5,376,624	-	-	5,376,624
2001	1,621,524	1,621,524	-	-	1,621,524
2002	239,493	239,493	-	-	239,493
2003	582,435	552,376	-	-	582,435
2004	2,060,194	2,053,795	-	-	2,060,194
2005	79,838	90,100	-	-	79,838
2006	-	-	-	-	-
2007	41,750	51,726	-	-	41,750
2008	51,787	66,060	105,515	91,192	51,787
2009	268,109	258,423	235,987	236,263	258,423
2010	-	-	84,462	57,616	-
2011	-	-	99,070	58,624	-
2012	-	-	112,491	64,913	-
2013	-	-	125,074	69,065	-
2014	-	-	134,602	80,135	-
2015	481,642	328,150	288,732	279,588	328,150
2016	-	-	158,292	85,475	-
2017	325,861	128,301	233,990	171,126	128,301
2018	-	-	200,523	146,106	173,314
TOTAL	13,508,906	13,118,729	1,778,736	1,340,102	13,293,989

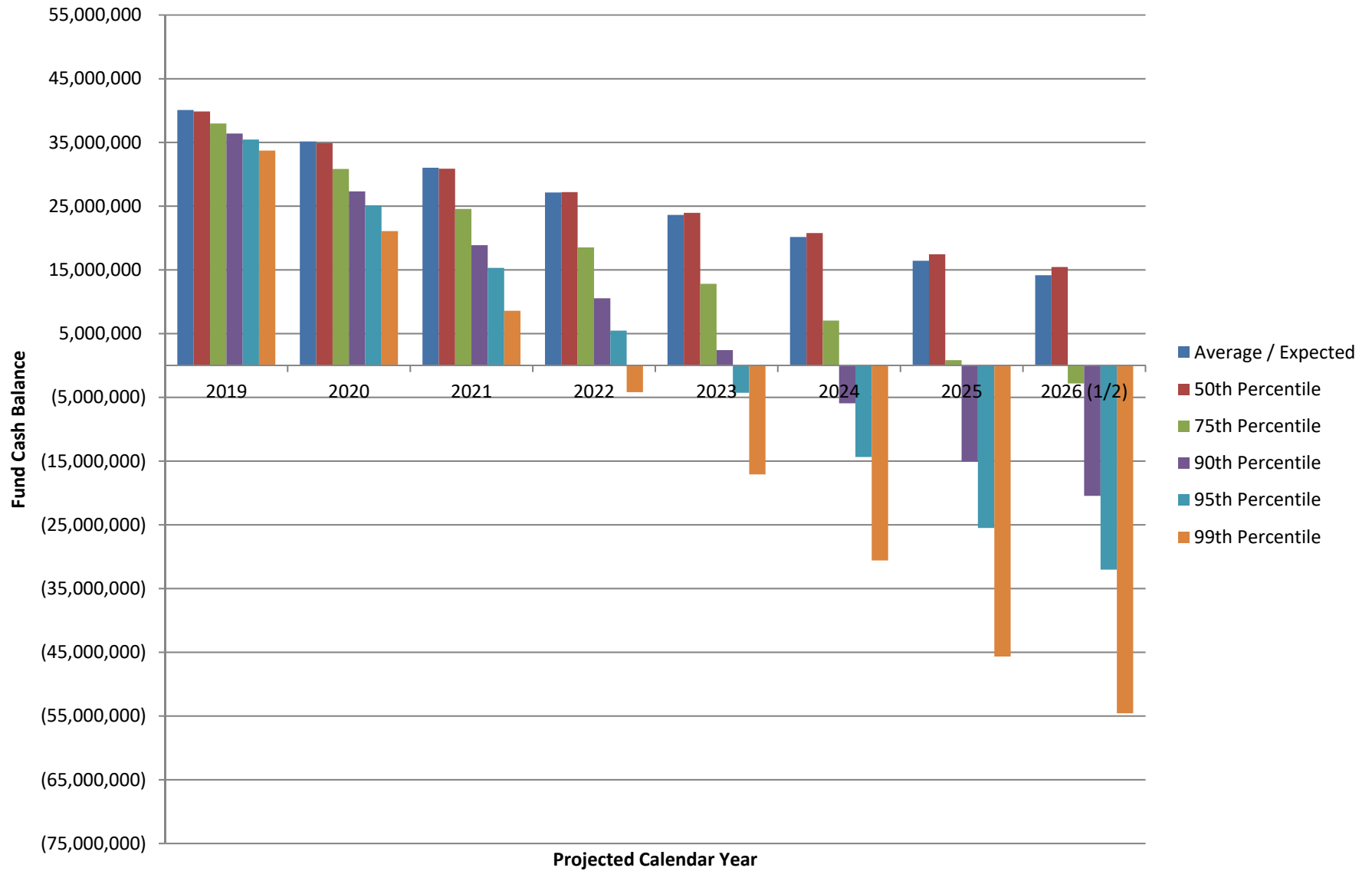
Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Summary of Case & IBNR Reserves

(1) <u>RY</u>	(2) <u>SELECTED ULTIMATE</u>	(3) <u>PAID LOSS</u>	(4) <u>INCURRED LOSS</u>	(5) <u>CASE RESERVE</u>	(6) <u>IBNR RESERVE</u>	(7) <u>UNPAID LOSS</u>
1994	-	-	-	-	-	-
1995	106,826	106,826	106,826	-	-	-
1996	109,456	109,456	109,456	-	-	-
1997	-	-	-	-	-	-
1998	635,093	635,092	635,093	1	-	1
1999	1,500,783	1,390,883	1,500,783	109,899	-	109,899
2000	5,376,624	3,920,130	5,376,624	1,456,494	-	1,456,494
2001	1,621,524	1,166,740	1,621,524	454,784	-	454,784
2002	239,493	239,493	239,493	-	-	-
2003	582,435	501,430	552,376	50,946	30,059	81,005
2004	2,060,194	1,703,105	1,859,341	156,236	200,853	357,089
2005	79,838	79,838	79,838	-	-	-
2006	-	-	-	-	-	-
2007	41,750	41,750	41,750	-	-	-
2008	51,787	51,787	51,787	-	-	-
2009	258,423	163,657	179,722	16,065	78,701	94,766
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	328,150	142,401	195,789	53,388	132,361	185,748
2016	-	-	-	-	-	-
2017	128,301	53,255	65,680	12,425	62,622	75,046
2018	173,314	-	-	-	173,314	173,314
TOTAL	13,293,989	10,305,842	12,616,079	2,310,237	677,910	2,988,146

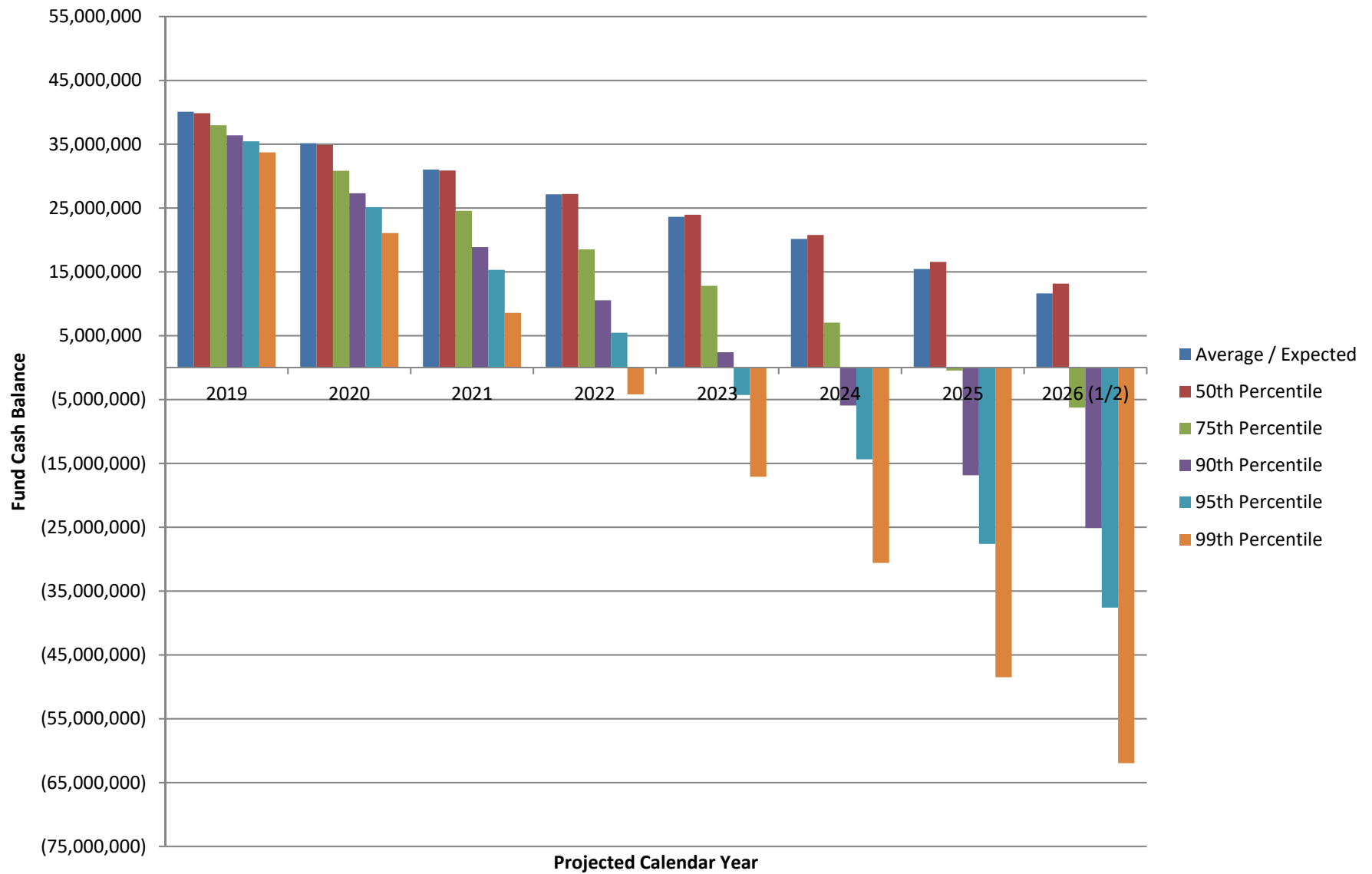
Projected Cash Balance by Calendar Year at Confidence Levels



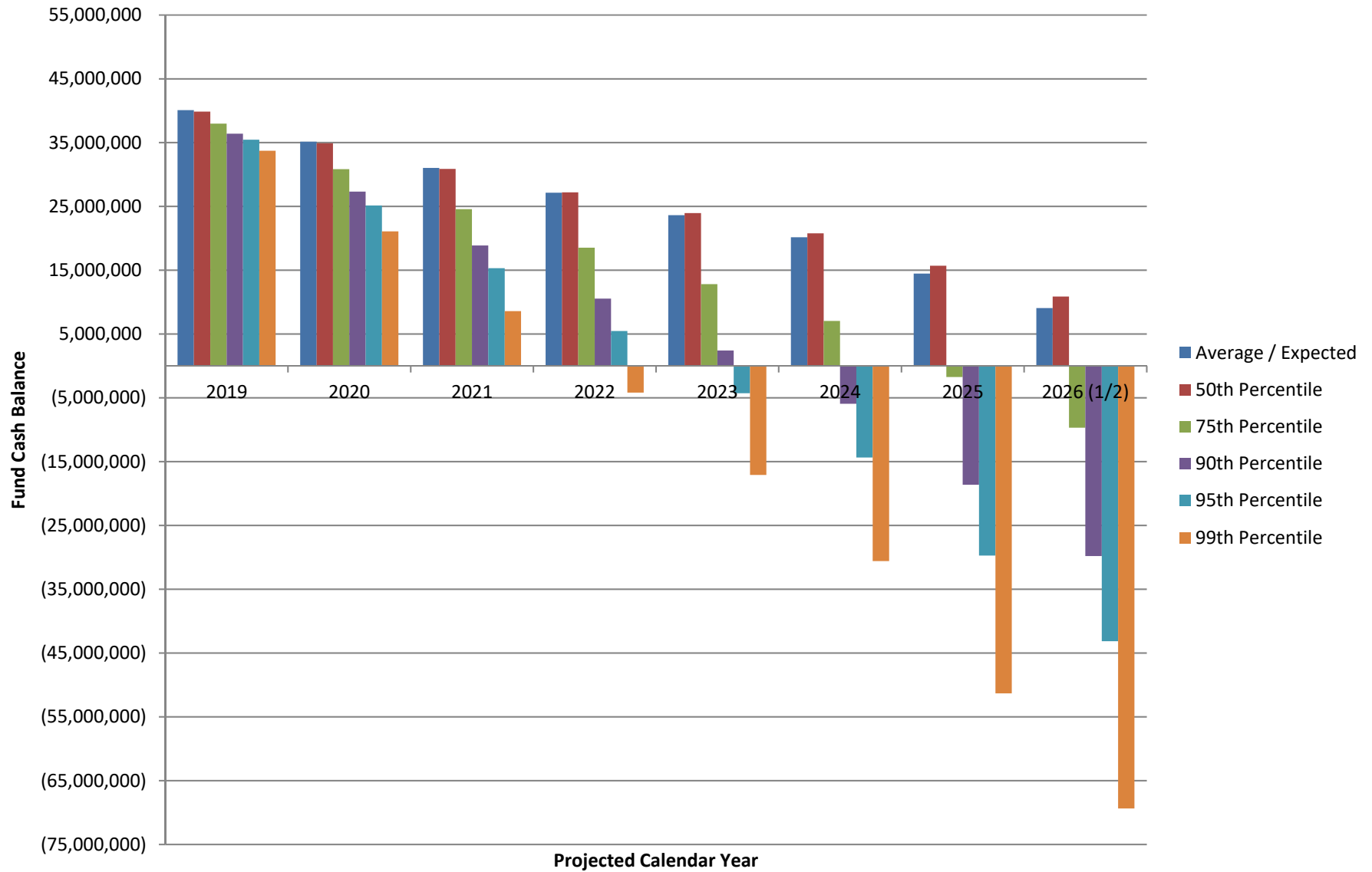
Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; Low Scenario



Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; Middle Scenario



Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; High Scenario



Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Financial Projections Based on PSTIF 2018 Projections

	(A) Annual Revenues Fiscal Year:	(B) 2019	(C) 2020	(D) 2021	(E) 2022	(F) 2023	(G) 2024	(H) 2025	(I) 2026 (1/2)	(J) Totals
(1)	Transport load fees	11,500,000	11,450,000	11,400,000	11,350,000	11,300,000	11,250,000	11,200,000	5,575,000	85,025,000
(2)	100 Initial tank fees	17,000	17,000	17,000	17,000	17,000	17,000	17,000	8,500	127,500
(3)	UST participation fees	890,000	890,000	890,000	890,000	890,000	890,000	890,000	445,000	6,675,000
(4)	AST participation fees	330,000	330,000	330,000	330,000	330,000	330,000	330,000	165,000	2,475,000
(5)	Interest income	785,000	705,714	617,173	542,770	477,227	416,585	359,177	152,035	4,055,681
(6)	Total Revenues	13,522,000	13,392,714	13,254,173	13,129,770	13,014,227	12,903,585	12,796,177	6,345,535	98,358,181
	Administrative Expenses Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,265,000	2,219,700	2,175,306	2,131,800	2,089,164	2,047,381	2,006,433	983,152	15,917,936
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	90,000	90,000	90,000	45,000	675,000
(9)	Office of Administration	82,401	84,873	87,419	90,042	92,743	95,525	98,391	50,671	682,066
(10)	Section 319.107 Expenses	10,000	10,300	10,609	10,927	11,255	11,593	11,941	6,149	82,774
(11)	Underwriting	555,650	572,320	589,489	607,174	625,389	644,151	663,475	341,690	4,599,337
(12)	Inspections	342,351	352,622	363,200	374,096	385,319	396,879	408,785	210,524	2,833,776
(13)	Training & Loss Prevention Services	12,000	12,360	12,731	13,113	13,506	13,911	14,329	7,379	99,329
(14)	Other Professional Expenses	431,135	444,069	457,391	471,113	485,246	499,804	514,798	265,121	3,568,676
(15)	Legal Expenses	200,000	206,000	212,180	218,545	225,102	231,855	238,810	122,987	1,655,480
(16)	Department of Revenue	45,303	46,662	48,062	49,504	50,989	52,519	54,094	27,858	374,991
(17)	Attorney General's Office	42,918	44,206	45,532	46,898	48,305	49,754	51,246	26,392	355,249
(18)	PSTIF Board/Staff	290,700	299,421	308,404	317,656	327,185	337,001	347,111	178,762	2,406,240
(19)	Department of Natural Resources	1,621,657	1,670,307	1,720,416	1,772,028	1,825,189	1,879,945	1,936,343	997,217	13,423,102
(20)	Total Administrative Expenses	5,989,115	6,052,838	6,120,739	6,192,895	6,269,392	6,350,316	6,435,756	3,262,904	46,673,956
	Claim Payments Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(21)	Average / Expected	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	9,604,324	4,546,594	82,171,552
(22)	50th Percentile Losses	13,608,254	12,309,629	11,144,380	10,608,634	10,004,831	9,720,437	9,256,942	4,363,470	81,016,577
(23)	75th Percentile Losses	15,498,439	14,466,006	13,414,596	12,968,550	12,460,868	12,320,816	11,922,823	5,671,501	98,723,600
(24)	90th Percentile Losses	17,073,153	16,418,408	15,570,942	15,270,575	14,876,630	14,901,642	14,619,517	6,997,014	115,727,880
(25)	95th Percentile Losses	18,011,217	17,652,805	16,968,054	16,774,229	16,490,203	16,633,864	16,433,722	7,899,802	126,863,895
(26)	99th Percentile Losses	19,736,079	19,979,910	19,642,345	19,699,351	19,651,135	20,057,405	20,018,264	9,700,490	148,484,979
(27)	Cash balance @ 6/30/18	45,933,353								
	Funds Available at Fiscal Year-End:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	
(28)	Average / Expected	40,088,122	35,140,876	31,018,971	27,151,612	23,627,186	20,153,893	16,909,989	15,446,026	
(29)	50th Percentile	39,857,984	34,888,231	30,877,285	27,205,526	23,945,530	20,778,363	17,881,840	16,601,001	
(30)	75th Percentile	37,967,799	30,841,669	24,560,507	18,528,832	12,812,798	7,045,251	1,482,849	(1,106,021)	
(31)	90th Percentile	36,393,085	27,314,553	18,877,046	10,543,346	2,411,550	(5,936,822)	(14,195,918)	(18,110,302)	
(32)	95th Percentile	35,455,021	25,142,091	15,307,472	5,470,118	(4,275,250)	(14,355,844)	(24,429,146)	(29,246,317)	
(33)	99th Percentile	33,730,159	21,090,125	8,581,215	(4,181,261)	(17,087,561)	(30,591,697)	(44,249,541)	(50,867,400)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2018

All Claim Types

Financial Projections Based on PSTIF 2018 Projections w/Increased Activity due to Sunset, Low Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2019	(C) 2020	(D) 2021	(E) 2022	(F) 2023	(G) 2024	(H) 2025	(I) 2026 (1/2)	(J) Totals
(1)	Transport load fees	11,500,000	11,450,000	11,400,000	11,350,000	11,300,000	11,250,000	11,200,000	5,575,000	85,025,000
(2)	100 Initial tank fees	17,000	17,000	17,000	17,000	17,000	17,000	17,000	8,500	127,500
(3)	UST participation fees	890,000	890,000	890,000	890,000	890,000	890,000	890,000	445,000	6,675,000
(4)	AST participation fees	330,000	330,000	330,000	330,000	330,000	330,000	330,000	165,000	2,475,000
(5)	Interest income	785,000	705,714	617,173	542,770	477,227	416,585	359,177	152,035	4,055,681
(6)	Total Revenues	13,522,000	13,392,714	13,254,173	13,129,770	13,014,227	12,903,585	12,796,177	6,345,535	98,358,181
	Administrative Expenses Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,265,000	2,219,700	2,175,306	2,131,800	2,089,164	2,047,381	2,006,433	983,152	15,917,936
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	90,000	90,000	90,000	45,000	675,000
(9)	Office of Administration	82,401	84,873	87,419	90,042	92,743	95,525	98,391	50,671	682,066
(10)	Section 319.107 Expenses	10,000	10,300	10,609	10,927	11,255	11,593	11,941	6,149	82,774
(11)	Underwriting	555,650	572,320	589,489	607,174	625,389	644,151	663,475	341,690	4,599,337
(12)	Inspections	342,351	352,622	363,200	374,096	385,319	396,879	408,785	210,524	2,833,776
(13)	Training & Loss Prevention Services	12,000	12,360	12,731	13,113	13,506	13,911	14,329	7,379	99,329
(14)	Other Professional Expenses	431,135	444,069	457,391	471,113	485,246	499,804	514,798	265,121	3,568,676
(15)	Legal Expenses	200,000	206,000	212,180	218,545	225,102	231,855	238,810	122,987	1,655,480
(16)	Department of Revenue	45,303	46,662	48,062	49,504	50,989	52,519	54,094	27,858	374,991
(17)	Attorney General's Office	42,918	44,206	45,532	46,898	48,305	49,754	51,246	26,392	355,249
(18)	PSTIF Board/Staff	290,700	299,421	308,404	317,656	327,185	337,001	347,111	178,762	2,406,240
(19)	Department of Natural Resources	1,621,657	1,670,307	1,720,416	1,772,028	1,825,189	1,879,945	1,936,343	997,217	13,423,102
(20)	Total Administrative Expenses	5,989,115	6,052,838	6,120,739	6,192,895	6,269,392	6,350,316	6,435,756	3,262,904	46,673,956
	Claim Payments Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(21)	Average / Expected	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	10,090,494	5,336,502	83,447,631
(22)	50th Percentile Losses	13,608,254	12,309,629	11,144,380	10,608,634	10,004,831	9,720,437	9,692,448	5,071,847	82,160,460
(23)	75th Percentile Losses	15,498,439	14,466,006	13,414,596	12,968,550	12,460,868	12,320,816	12,569,046	6,741,927	100,440,249
(24)	90th Percentile Losses	17,073,153	16,418,408	15,570,942	15,270,575	14,876,630	14,901,642	15,504,621	8,450,002	118,065,972
(25)	95th Percentile Losses	18,011,217	17,652,805	16,968,054	16,774,229	16,490,203	16,633,864	17,493,239	9,621,157	129,644,767
(26)	99th Percentile Losses	19,736,079	19,979,910	19,642,345	19,699,351	19,651,135	20,057,405	21,431,089	11,987,126	152,184,439
(27)	Cash balance @ 6/30/18	45,933,353								
	Funds Available at Fiscal Year-End:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	
(28)	Average / Expected	40,088,122	35,140,876	31,018,971	27,151,612	23,627,186	20,153,893	16,423,819	14,169,947	
(29)	50th Percentile	39,857,984	34,888,231	30,877,285	27,205,526	23,945,530	20,778,363	17,446,335	15,457,118	
(30)	75th Percentile	37,967,799	30,841,669	24,560,507	18,528,832	12,812,798	7,045,251	836,626	(2,822,670)	
(31)	90th Percentile	36,393,085	27,314,553	18,877,046	10,543,346	2,411,550	(5,936,822)	(15,081,023)	(20,448,394)	
(32)	95th Percentile	35,455,021	25,142,091	15,307,472	5,470,118	(4,275,250)	(14,355,844)	(25,488,663)	(32,027,189)	
(33)	99th Percentile	33,730,159	21,090,125	8,581,215	(4,181,261)	(17,087,561)	(30,591,697)	(45,662,366)	(54,566,860)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2018

All Claim Types

Financial Projections Based on PSTIF 2018 Projections w/Increased Activity due to Sunset, Middle Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2019	(C) 2020	(D) 2021	(E) 2022	(F) 2023	(G) 2024	(H) 2025	(I) 2026 (1/2)	(J) Totals
(1)	Transport load fees	11,500,000	11,450,000	11,400,000	11,350,000	11,300,000	11,250,000	11,200,000	5,575,000	85,025,000
(2)	100 Initial tank fees	17,000	17,000	17,000	17,000	17,000	17,000	17,000	8,500	127,500
(3)	UST participation fees	890,000	890,000	890,000	890,000	890,000	890,000	890,000	445,000	6,675,000
(4)	AST participation fees	330,000	330,000	330,000	330,000	330,000	330,000	330,000	165,000	2,475,000
(5)	Interest income	785,000	705,714	617,173	542,770	477,227	416,585	359,177	152,035	4,055,681
(6)	Total Revenues	13,522,000	13,392,714	13,254,173	13,129,770	13,014,227	12,903,585	12,796,177	6,345,535	98,358,181
	Administrative Expenses Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,265,000	2,219,700	2,175,306	2,131,800	2,089,164	2,047,381	2,006,433	983,152	15,917,936
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	90,000	90,000	90,000	45,000	675,000
(9)	Office of Administration	82,401	84,873	87,419	90,042	92,743	95,525	98,391	50,671	682,066
(10)	Section 319.107 Expenses	10,000	10,300	10,609	10,927	11,255	11,593	11,941	6,149	82,774
(11)	Underwriting	555,650	572,320	589,489	607,174	625,389	644,151	663,475	341,690	4,599,337
(12)	Inspections	342,351	352,622	363,200	374,096	385,319	396,879	408,785	210,524	2,833,776
(13)	Training & Loss Prevention Services	12,000	12,360	12,731	13,113	13,506	13,911	14,329	7,379	99,329
(14)	Other Professional Expenses	431,135	444,069	457,391	471,113	485,246	499,804	514,798	265,121	3,568,676
(15)	Legal Expenses	200,000	206,000	212,180	218,545	225,102	231,855	238,810	122,987	1,655,480
(16)	Department of Revenue	45,303	46,662	48,062	49,504	50,989	52,519	54,094	27,858	374,991
(17)	Attorney General's Office	42,918	44,206	45,532	46,898	48,305	49,754	51,246	26,392	355,249
(18)	PSTIF Board/Staff	290,700	299,421	308,404	317,656	327,185	337,001	347,111	178,762	2,406,240
(19)	Department of Natural Resources	1,621,657	1,670,307	1,720,416	1,772,028	1,825,189	1,879,945	1,936,343	997,217	13,423,102
(20)	Total Administrative Expenses	5,989,115	6,052,838	6,120,739	6,192,895	6,269,392	6,350,316	6,435,756	3,262,904	46,673,956
	Claim Payments Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(21)	Average / Expected	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	11,062,835	6,916,319	85,999,789
(22)	50th Percentile Losses	13,608,254	12,309,629	11,144,380	10,608,634	10,004,831	9,720,437	10,563,459	6,488,602	84,448,226
(23)	75th Percentile Losses	15,498,439	14,466,006	13,414,596	12,968,550	12,460,868	12,320,816	13,861,492	8,882,779	103,873,547
(24)	90th Percentile Losses	17,073,153	16,418,408	15,570,942	15,270,575	14,876,630	14,901,642	17,274,831	11,355,976	122,742,156
(25)	95th Percentile Losses	18,011,217	17,652,805	16,968,054	16,774,229	16,490,203	16,633,864	19,612,274	13,063,867	135,206,512
(26)	99th Percentile Losses	19,736,079	19,979,910	19,642,345	19,699,351	19,651,135	20,057,405	24,256,738	16,560,397	159,583,359
(27)	Cash balance @ 6/30/18	45,933,353								
	Funds Available at Fiscal Year-End:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	
(28)	Average / Expected	40,088,122	35,140,876	31,018,971	27,151,612	23,627,186	20,153,893	15,451,478	11,617,789	
(29)	50th Percentile	39,857,984	34,888,231	30,877,285	27,205,526	23,945,530	20,778,363	16,575,323	13,169,352	
(30)	75th Percentile	37,967,799	30,841,669	24,560,507	18,528,832	12,812,798	7,045,251	(455,820)	(6,255,968)	
(31)	90th Percentile	36,393,085	27,314,553	18,877,046	10,543,346	2,411,550	(5,936,822)	(16,851,232)	(25,124,578)	
(32)	95th Percentile	35,455,021	25,142,091	15,307,472	5,470,118	(4,275,250)	(14,355,844)	(27,607,698)	(37,588,934)	
(33)	99th Percentile	33,730,159	21,090,125	8,581,215	(4,181,261)	(17,087,561)	(30,591,697)	(48,488,015)	(61,965,781)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2018

All Claim Types

Financial Projections Based on PSTIF 2018 Projections w/Increased Activity due to Sunset, High Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2019	(C) 2020	(D) 2021	(E) 2022	(F) 2023	(G) 2024	(H) 2025	(I) 2026 (1/2)	(J) Totals
(1)	Transport load fees	11,500,000	11,450,000	11,400,000	11,350,000	11,300,000	11,250,000	11,200,000	5,575,000	85,025,000
(2)	100 Initial tank fees	17,000	17,000	17,000	17,000	17,000	17,000	17,000	8,500	127,500
(3)	UST participation fees	890,000	890,000	890,000	890,000	890,000	890,000	890,000	445,000	6,675,000
(4)	AST participation fees	330,000	330,000	330,000	330,000	330,000	330,000	330,000	165,000	2,475,000
(5)	Interest income	785,000	705,714	617,173	542,770	477,227	416,585	359,177	152,035	4,055,681
(6)	Total Revenues	13,522,000	13,392,714	13,254,173	13,129,770	13,014,227	12,903,585	12,796,177	6,345,535	98,358,181
	Administrative Expenses Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,265,000	2,219,700	2,175,306	2,131,800	2,089,164	2,047,381	2,006,433	983,152	15,917,936
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	90,000	90,000	90,000	45,000	675,000
(9)	Office of Administration	82,401	84,873	87,419	90,042	92,743	95,525	98,391	50,671	682,066
(10)	Section 319.107 Expenses	10,000	10,300	10,609	10,927	11,255	11,593	11,941	6,149	82,774
(11)	Underwriting	555,650	572,320	589,489	607,174	625,389	644,151	663,475	341,690	4,599,337
(12)	Inspections	342,351	352,622	363,200	374,096	385,319	396,879	408,785	210,524	2,833,776
(13)	Training & Loss Prevention Services	12,000	12,360	12,731	13,113	13,506	13,911	14,329	7,379	99,329
(14)	Other Professional Expenses	431,135	444,069	457,391	471,113	485,246	499,804	514,798	265,121	3,568,676
(15)	Legal Expenses	200,000	206,000	212,180	218,545	225,102	231,855	238,810	122,987	1,655,480
(16)	Department of Revenue	45,303	46,662	48,062	49,504	50,989	52,519	54,094	27,858	374,991
(17)	Attorney General's Office	42,918	44,206	45,532	46,898	48,305	49,754	51,246	26,392	355,249
(18)	PSTIF Board/Staff	290,700	299,421	308,404	317,656	327,185	337,001	347,111	178,762	2,406,240
(19)	Department of Natural Resources	1,621,657	1,670,307	1,720,416	1,772,028	1,825,189	1,879,945	1,936,343	997,217	13,423,102
(20)	Total Administrative Expenses	5,989,115	6,052,838	6,120,739	6,192,895	6,269,392	6,350,316	6,435,756	3,262,904	46,673,956
	Claim Payments Fiscal Year:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(21)	Average / Expected	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	12,035,177	8,496,136	88,551,947
(22)	50th Percentile Losses	13,608,254	12,309,629	11,144,380	10,608,634	10,004,831	9,720,437	11,434,471	7,905,357	86,735,992
(23)	75th Percentile Losses	15,498,439	14,466,006	13,414,596	12,968,550	12,460,868	12,320,816	15,153,938	11,023,631	107,306,845
(24)	90th Percentile Losses	17,073,153	16,418,408	15,570,942	15,270,575	14,876,630	14,901,642	19,045,040	14,261,951	127,418,340
(25)	95th Percentile Losses	18,011,217	17,652,805	16,968,054	16,774,229	16,490,203	16,633,864	21,731,309	16,506,576	140,768,257
(26)	99th Percentile Losses	19,736,079	19,979,910	19,642,345	19,699,351	19,651,135	20,057,405	27,082,387	21,133,668	166,982,280
(27)	Cash balance @ 6/30/18	45,933,353								
	Funds Available at Fiscal Year-End:	2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	
(28)	Average / Expected	40,088,122	35,140,876	31,018,971	27,151,612	23,627,186	20,153,893	14,479,136	9,065,631	
(29)	50th Percentile	39,857,984	34,888,231	30,877,285	27,205,526	23,945,530	20,778,363	15,704,312	10,881,586	
(30)	75th Percentile	37,967,799	30,841,669	24,560,507	18,528,832	12,812,798	7,045,251	(1,748,266)	(9,689,266)	
(31)	90th Percentile	36,393,085	27,314,553	18,877,046	10,543,346	2,411,550	(5,936,822)	(18,621,442)	(29,800,762)	
(32)	95th Percentile	35,455,021	25,142,091	15,307,472	5,470,118	(4,275,250)	(14,355,844)	(29,726,733)	(43,150,678)	
(33)	99th Percentile	33,730,159	21,090,125	8,581,215	(4,181,261)	(17,087,561)	(30,591,697)	(51,313,664)	(69,364,701)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

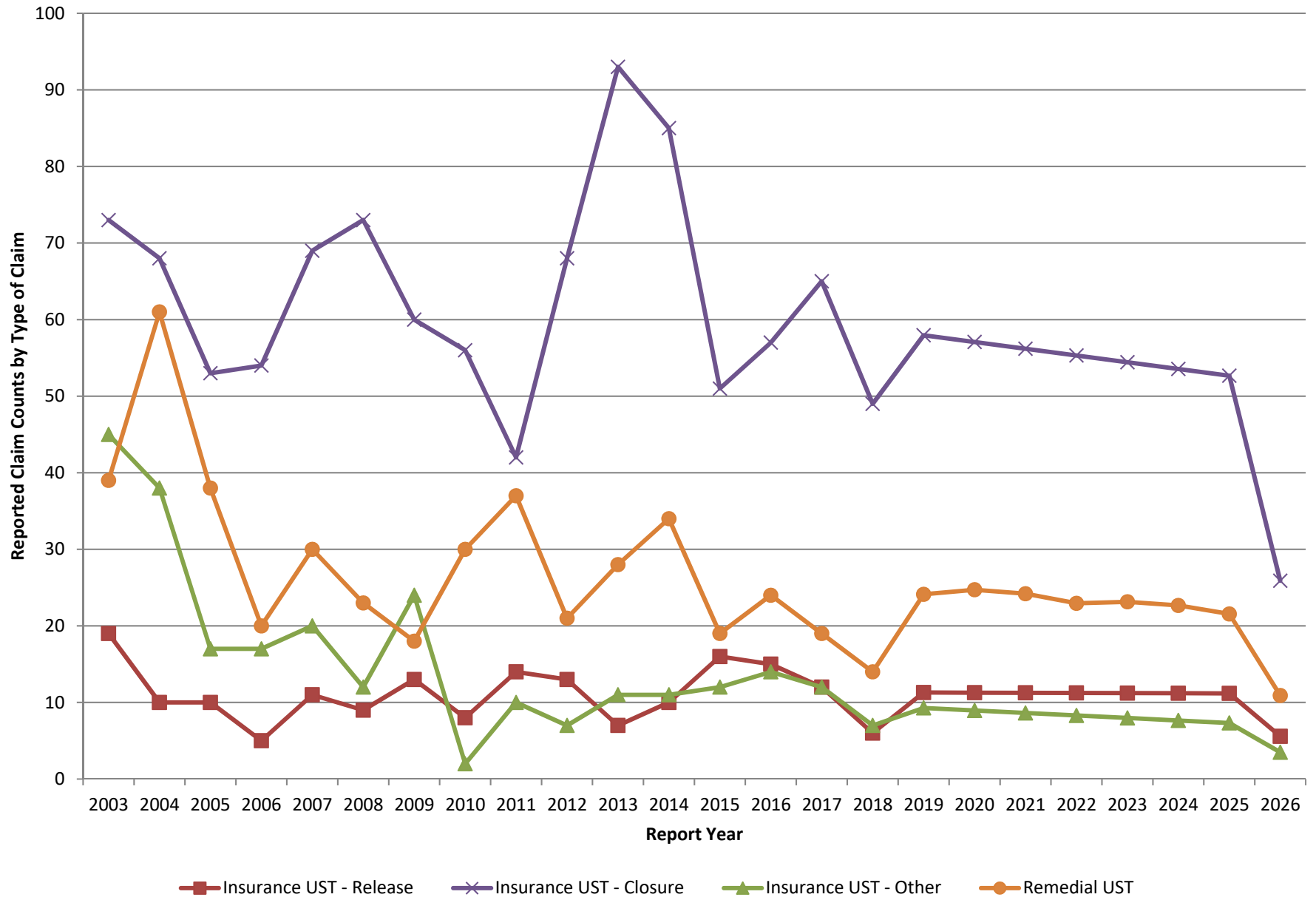
Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Financial Projection Cash Flow Detail

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Claim Payments Arising from Current Reserves (Report Years 2018 and Prior)										
		2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(1)	50th Percentile Losses	13,133,447	10,530,087	8,625,221	7,593,698	6,550,296	5,911,543	5,190,264	2,343,210	59,877,765
(2)	75th Percentile Losses	14,799,300	11,820,894	9,658,567	8,469,230	7,298,518	6,616,661	5,825,860	2,628,490	67,117,521
(3)	90th Percentile Losses	16,121,259	12,844,988	10,478,991	9,165,773	7,892,340	7,176,243	6,330,913	2,854,791	72,865,299
(4)	95th Percentile Losses	16,869,558	13,424,495	10,942,905	9,559,207	8,227,800	7,493,044	6,616,909	2,982,860	76,116,779
(5)	99th Percentile Losses	18,258,690	14,493,820	11,799,611	10,287,533	8,846,988	8,074,570	7,140,244	3,217,194	82,118,649
(6)	Mean	12,848,284	10,310,327	8,452,170	7,451,819	6,428,010	5,792,083	5,081,083	2,294,117	58,657,893

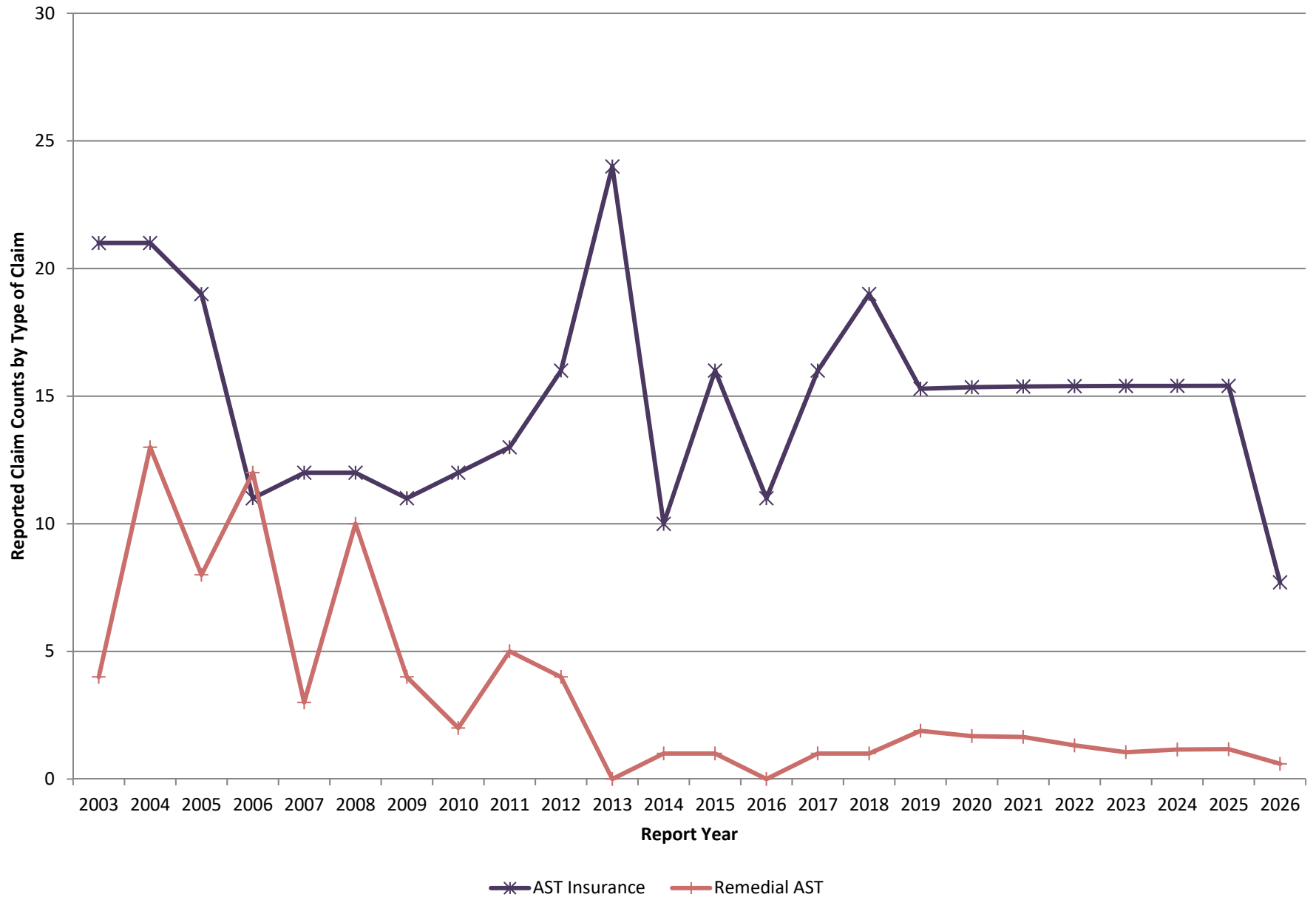
Claim Payments Arising from Future Claims (Report Years 2019 through 12/31/2025)										
		2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(7)	50th Percentile Losses	474,807	1,779,542	2,519,159	3,014,936	3,454,534	3,808,894	4,066,679	2,020,260	21,138,811
(8)	75th Percentile Losses	699,139	2,645,112	3,756,029	4,499,320	5,162,350	5,704,155	6,096,963	3,043,010	31,606,079
(9)	90th Percentile Losses	951,893	3,573,419	5,091,951	6,104,802	6,984,290	7,725,399	8,288,603	4,142,223	42,862,581
(10)	95th Percentile Losses	1,141,659	4,228,310	6,025,149	7,215,022	8,262,403	9,140,820	9,816,812	4,916,942	50,747,117
(11)	99th Percentile Losses	1,477,389	5,486,089	7,842,734	9,411,818	10,804,147	11,982,836	12,878,020	6,483,296	66,366,329
(12)	Mean	529,832	1,976,794	2,803,169	3,352,415	3,841,251	4,234,479	4,523,241	2,252,477	23,513,659

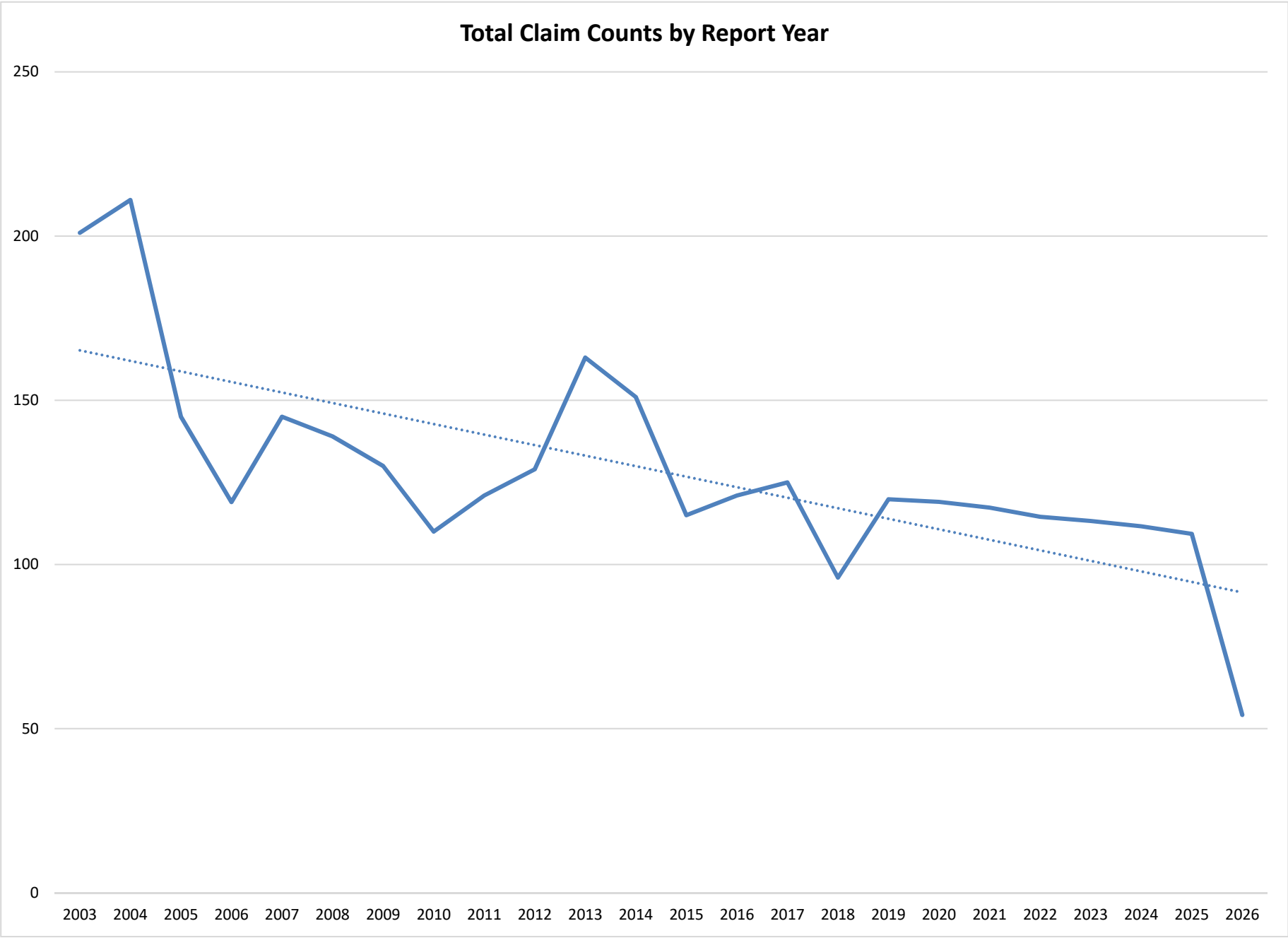
Total Projected Claim Payments										
		2019	2020	2021	2022	2023	2024	2025	2026 (1/2)	Totals
(13)	50th Percentile Losses	13,608,254	12,309,629	11,144,380	10,608,634	10,004,831	9,720,437	9,256,942	4,363,470	81,016,577
(14)	75th Percentile Losses	15,498,439	14,466,006	13,414,596	12,968,550	12,460,868	12,320,816	11,922,823	5,671,501	98,723,600
(15)	90th Percentile Losses	17,073,153	16,418,408	15,570,942	15,270,575	14,876,630	14,901,642	14,619,517	6,997,014	115,727,880
(16)	95th Percentile Losses	18,011,217	17,652,805	16,968,054	16,774,229	16,490,203	16,633,864	16,433,722	7,899,802	126,863,895
(17)	99th Percentile Losses	19,736,079	19,979,910	19,642,345	19,699,351	19,651,135	20,057,405	20,018,264	9,700,490	148,484,979
(18)	Mean	13,378,116	12,287,121	11,255,339	10,804,233	10,269,262	10,026,562	9,604,324	4,546,594	82,171,552

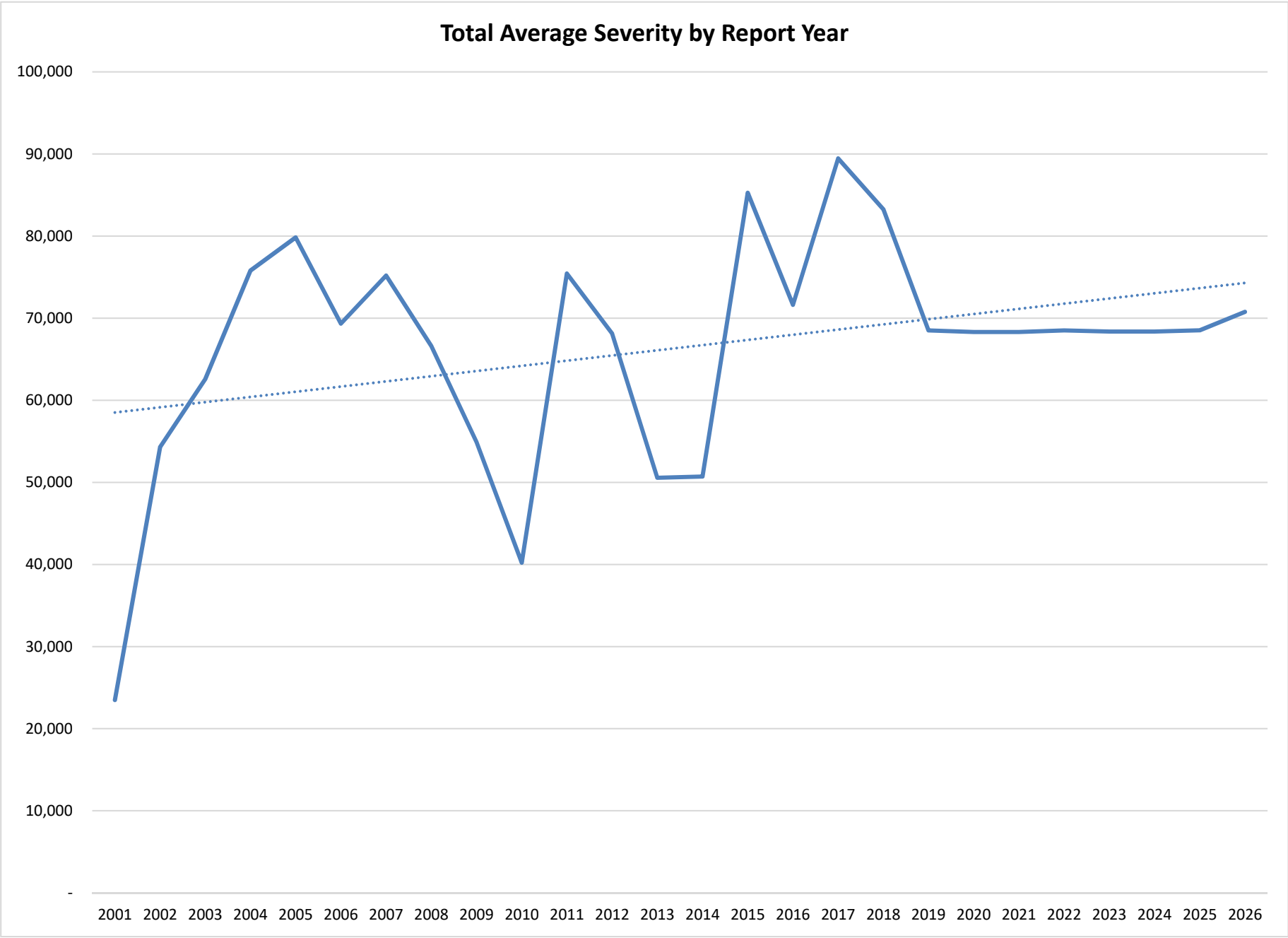
Projected Reported Claim Counts by Claim Type



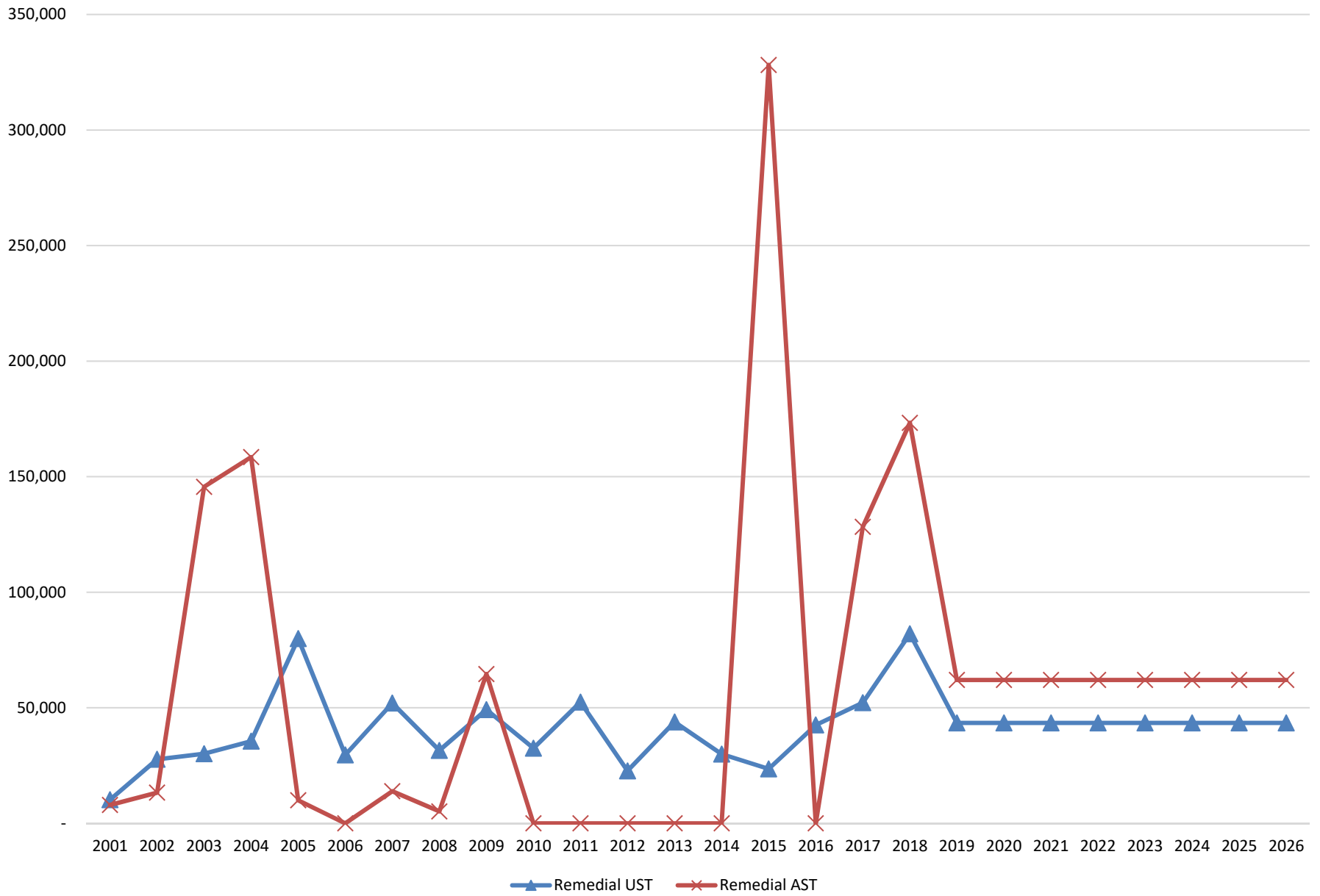
Projected Reported Claim Counts by Claim Type

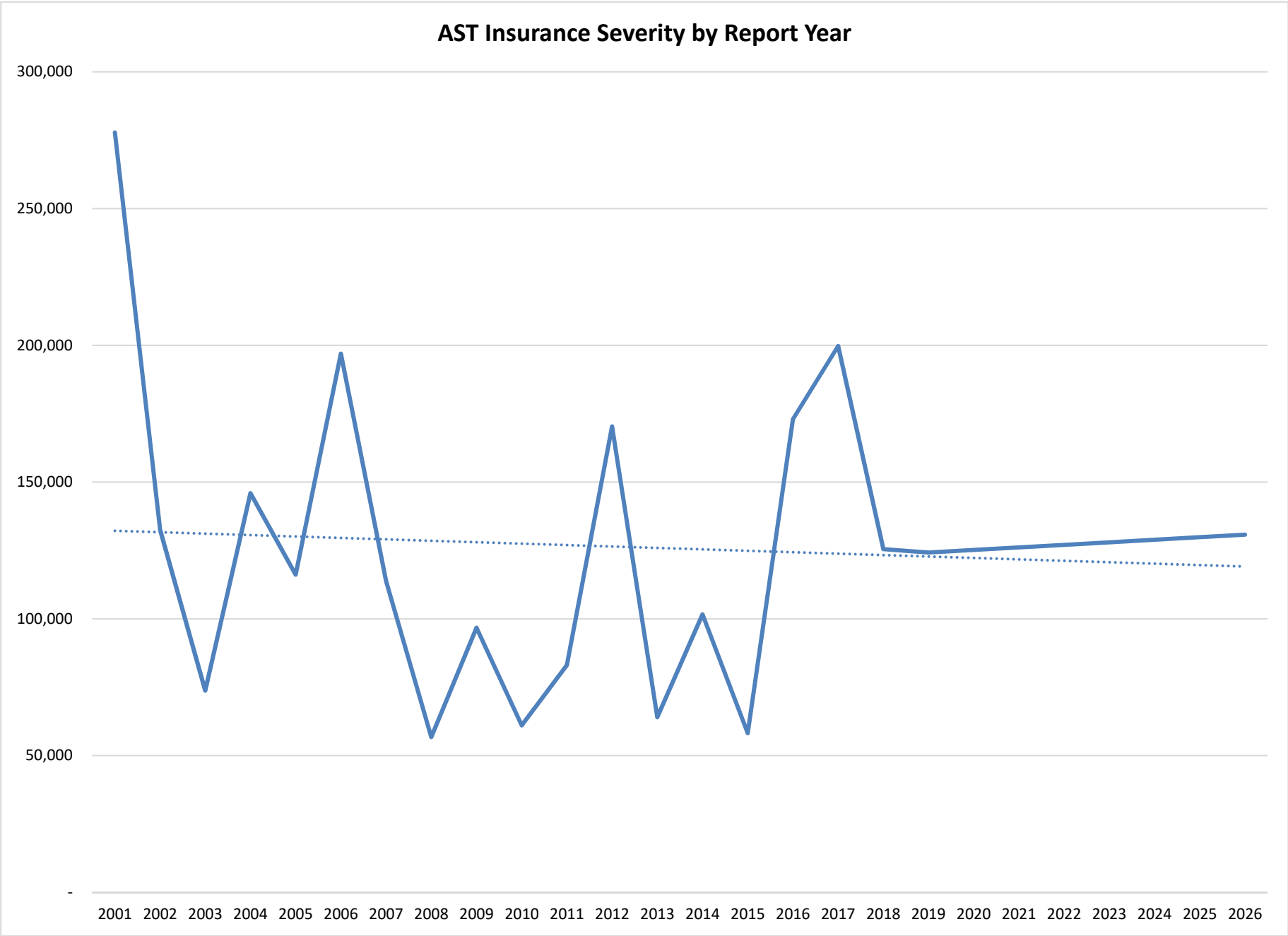


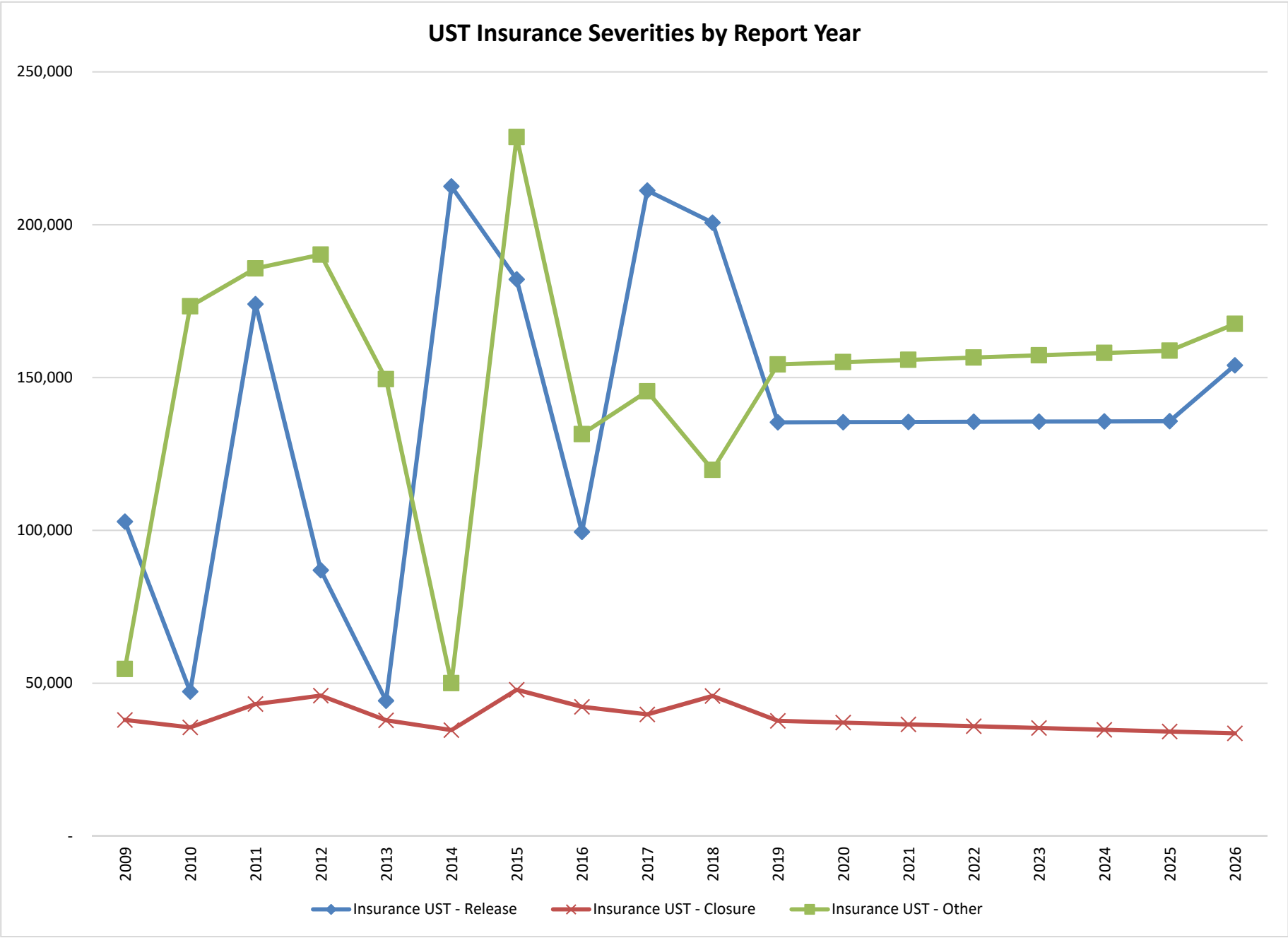




Remedial Claim Severities by Report Year







Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST Claims
Projection of Future Frequencies and Severities

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
RY	UST POLS IN FORCE	REPORTED CLAIM COUNTS			ULTIMATE LOSS SEVERITY			ULTIMATE LOSSES		
		RELEASE	CLOSURE	OTHER	RELEASE	CLOSURE	OTHER	RELEASE	CLOSURE	OTHER
1994		3	15	56						
1995		6	34	39	40,326	24,430	75,534	241,953	830,629	2,945,818
1996		12	83	31	131,597	46,784	76,783	1,579,163	3,883,098	2,380,279
1997		22	126	28	90,724	36,848	135,108	1,995,927	4,642,882	3,783,030
1998		19	161	38	72,700	33,311	80,404	1,381,308	5,363,065	3,055,366
1999		8	226	20	17,822	42,376	142,415	142,573	9,576,992	2,848,305
2000		26	90	59	85,356	63,505	67,357	2,219,267	5,715,439	3,974,075
2001		23	65	36	47,171	35,032	32,349	1,084,938	2,277,058	1,164,580
2002		20	68	47	36,354	65,973	102,097	727,076	4,486,171	4,798,581
2003		19	73	45	118,049	47,321	79,467	2,242,938	3,454,424	3,576,030
2004		10	68	38	142,036	35,291	128,424	1,420,364	2,399,803	4,880,095
2005		10	53	17	124,665	52,573	130,562	1,246,652	2,786,378	2,219,551
2006		5	54	17	46,842	30,273	213,151	234,210	1,634,727	3,623,565
2007		11	69	20	260,925	58,021	53,108	2,870,172	4,003,475	1,062,164
2008	2,664	9	73	12	241,243	42,905	208,124	2,171,186	3,132,091	2,497,484
2009	2,662	13	60	24	102,882	37,986	54,644	1,337,464	2,279,162	1,311,453
2010	2,622	8	56	2	47,263	35,558	173,298	378,102	1,991,260	346,596
2011	2,623	14	42	10	174,046	43,186	185,690	2,436,639	1,813,826	1,856,897
2012	2,617	13	68	7	86,972	45,954	190,214	1,130,634	3,124,869	1,331,501
2013	2,603	7	93	11	44,256	37,882	149,454	309,791	3,523,009	1,643,996
2014	2,573	10	85	11	212,527	34,663	50,024	2,125,274	2,946,370	550,266
2015	2,530	16	51	12	182,130	47,874	228,687	2,914,088	2,441,555	2,744,243
2016	2,509	15	57	14	99,517	42,275	131,479	1,492,761	2,409,675	1,840,713
2017	2,489	12	65	12	211,182	39,798	145,466	2,534,186	2,586,852	1,745,586
2018	2,487	6	49	7	200,686	45,834	119,785	1,204,117	2,245,872	838,492
2019	2,451	11	58	9	135,349	37,699	154,288	1,529,415	2,184,974	1,431,836
2020	2,428	11	57	9	135,411	37,114	155,036	1,527,543	2,118,422	1,388,207
2021	2,406	11	56	9	135,473	36,530	155,784	1,525,670	2,052,898	1,344,091
2022	2,383	11	55	8	135,535	35,945	156,532	1,523,794	1,988,404	1,299,486
2023	2,360	11	54	8	135,597	35,361	157,279	1,521,915	1,924,939	1,254,394
2024	2,337	11	54	8	135,659	34,776	158,027	1,520,035	1,862,504	1,208,814
2025	2,314	11	53	7	135,721	34,192	158,775	1,518,152	1,801,097	1,162,746
2026	2,291	6	26	3	154,030	33,607	167,545	860,011	870,360	586,159

Notes: Future RYs for Cols (2), (6), (7), and (8) are linearly interpolated against report year.
Future RYs for Cols (3), (4), and (5) are linearly interpolated against Col (2).
Col (9) = (3) x (6); Col (10) = (4) x (7); Col (11) = (5) x (8).

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST Claims
Projection of Future Frequencies and Severities

(1) <u>RY</u>	(2) <u>AST POLS IN FORCE</u>	(3) <u>REPORTED CLAIMS</u>	(4) <u>ULTIMATE SEVERITY</u>	(5) <u>ULTIMATE LOSS</u>
1994			-	-
1995			-	-
1996			-	-
1997			-	-
1998		1	478,042	478,042
1999		7	384,176	2,689,230
2000		13	91,984	1,195,793
2001		24	277,825	6,667,797
2002		18	132,566	2,386,183
2003		21	73,729	1,548,303
2004		21	145,951	3,064,971
2005		19	116,139	2,206,643
2006		11	196,992	2,166,914
2007		12	113,771	1,365,248
2008	517	12	56,767	681,208
2009	563	11	96,762	1,064,378
2010	578	12	61,064	732,765
2011	810	13	83,045	1,079,586
2012	975	16	170,361	2,725,771
2013	1,003	24	64,038	1,536,904
2014	1,030	10	101,654	1,016,535
2015	1,021	16	58,189	931,030
2016	1,010	11	173,010	1,903,113
2017	1,005	16	199,759	3,196,149
2018	999	19	125,468	2,383,894
2019	1,013	15	124,243	1,899,755
2020	1,020	15	125,176	1,921,320
2021	1,023	15	126,110	1,939,323
2022	1,025	15	127,044	1,955,530
2023	1,026	15	127,977	1,970,834
2024	1,026	15	128,911	1,985,682
2025	1,027	15	129,845	2,000,301
2026	1,027	8	130,779	1,007,402

Notes: Future RYs for Col (2) are increased by a decreasing percentage to a maximum of 1,028 based on assumptions from PSTIF.
Future RYs for Col (3) are linearly interpolated against Col (2).
Col (5) = (3) x (4).

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial Claims
Projection of Future Frequencies and Severities

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
RY	POTENTIAL SITES		REPORTED CLAIM COUNTS		% REPORTED ON PREV YR		ULTIMATE LOSS SEVERITY		ULTIMATE LOSS	
	UST	AST	UST	AST	UST	AST	UST	AST	UST	AST
1994	15,480	2,403	-	-						
1995	15,479	2,402	1	1	0.01%	0.04%	114,027	106,826	114,027	106,826
1996	14,166	2,399	1,314	3	8.49%	0.12%	51,612	36,485	67,818,570	109,456
1997	13,952	2,399	214	-	1.51%	0.00%	40,702	-	8,710,315	-
1998	13,633	2,387	319	12	2.29%	0.50%	60,037	52,924	19,151,801	635,093
1999	13,255	2,376	378	11	2.77%	0.46%	21,830	136,435	8,251,760	1,500,783
2000	12,696	2,327	558	50	4.21%	2.10%	26,860	107,532	14,987,967	5,376,624
2001	12,354	2,123	342	204	2.69%	8.77%	10,190	7,949	3,485,098	1,621,524
2002	12,228	2,105	126	18	1.02%	0.85%	27,703	13,305	3,490,517	239,493
2003	12,189	2,101	39	4	0.32%	0.19%	30,108	145,609	1,174,225	582,435
2004	12,129	2,088	61	13	0.50%	0.62%	35,535	158,476	2,167,660	2,060,194
2005	12,091	2,080	38	8	0.31%	0.38%	79,935	9,980	3,037,513	79,838
2006	12,073	2,068	20	12	0.17%	0.58%	29,600	-	592,007	-
2007	12,043	2,065	30	3	0.25%	0.15%	52,030	13,917	1,560,892	41,750
2008	12,021	2,055	23	10	0.19%	0.48%	31,535	5,179	725,305	51,787
2009	12,003	2,051	18	4	0.15%	0.19%	49,201	64,606	885,617	258,423
2010	11,973	2,049	30	2	0.25%	0.10%	32,513	-	975,390	-
2011	11,936	2,044	37	5	0.31%	0.24%	52,453	-	1,940,749	-
2012	11,915	2,040	21	4	0.18%	0.20%	22,691	-	476,515	-
2013	11,887	2,040	28	-	0.23%	0.00%	43,841	-	1,227,539	-
2014	11,853	2,039	34	1	0.29%	0.05%	29,964	-	1,018,773	-
2015	11,834	2,038	19	1	0.16%	0.05%	23,542	328,150	447,294	328,150
2016	11,810	2,038	24	-	0.20%	0.00%	42,545	-	1,021,080	-
2017	11,791	2,037	19	1	0.16%	0.05%	52,204	128,301	991,881	128,301
2018	11,777	2,036	14	1	0.12%	0.05%	81,990	173,314	1,147,856	173,314
2019	11,753	2,034	24	2	0.20%	0.09%	43,444	62,041	1,048,028	117,234
2020	11,728	2,032	25	2	0.21%	0.08%	43,444	62,041	1,074,015	104,273
2021	11,704	2,031	24	2	0.21%	0.08%	43,444	62,041	1,051,585	102,310
2022	11,681	2,029	23	1	0.20%	0.06%	43,444	62,041	997,226	81,705
2023	11,658	2,028	23	1	0.20%	0.05%	43,444	62,041	1,005,515	65,177
2024	11,635	2,027	23	1	0.19%	0.06%	43,444	62,041	984,858	71,657
2025	11,614	2,026	22	1	0.19%	0.06%	43,444	62,041	936,657	72,613
2026	11,603	2,025	11	1	0.09%	0.03%	43,444	62,041	473,769	36,832

Notes: Future RYs for Cols (2) and (3) are [prior year sites] x (1 - [% reported from col (6) or (7)])
Future RYs for Cols (4) and (5) are the change in Cols (2) and (3), respectively.
Future RYs for Cols (6) and (7) are rolling average of prior 10 years.
Future RYs for Cols (8) and (9) are long-term averages from 1995-2018

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
Cash Flow Summary

UNDISCOUNTED VALUE OF CURRENT RESERVES - PAYMENT STREAM

<u>Category</u>	<u>Total</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>After 2027</u>
Insurance UST - Release	11,866,745	1,838,008	1,497,017	1,183,730	948,946	927,318	825,469	659,544	656,253	651,920	2,678,540
Insurance UST - Closure	15,601,657	2,904,726	1,971,767	1,583,375	1,372,229	1,114,891	962,410	807,420	720,731	629,948	3,534,161
Insurance UST - Other	15,726,672	2,441,217	2,008,736	1,661,706	1,554,590	1,288,488	1,068,481	884,049	813,495	706,200	3,299,710
Remedial UST	23,809,166	3,188,456	2,932,354	2,495,852	2,346,134	2,038,194	1,898,491	1,682,613	1,450,389	1,231,538	4,545,146
Insurance AST	13,478,673	1,807,156	1,436,787	1,214,005	1,029,222	911,219	806,584	807,147	750,446	684,821	4,031,285
Remedial AST	2,988,146	612,726	418,806	276,761	168,295	119,954	205,600	218,453	177,116	158,297	632,138
Total	83,471,060	12,792,289	10,265,468	8,415,429	7,419,416	6,400,064	5,767,035	5,059,225	4,568,430	4,062,724	18,720,980
Percent of Current Total											
Paid by Year - Undiscounted	100.0%	15.3%	12.3%	10.1%	8.9%	7.7%	6.9%	6.1%	5.5%	4.9%	22.4%

DISCOUNTED VALUE OF CURRENT RESERVES - PAYMENT STREAM

<u>Category</u>	<u>Total</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>After 2027</u>
Insurance UST - Release	10,841,003	1,823,113	1,460,914	1,136,535	896,403	861,832	754,791	593,337	580,846	567,697	2,165,536
Insurance UST - Closure	14,279,417	2,881,185	1,924,215	1,520,245	1,296,249	1,036,159	880,007	726,369	637,915	548,563	2,828,509
Insurance UST - Other	14,408,288	2,421,433	1,960,292	1,595,453	1,468,513	1,197,497	976,996	795,306	720,020	614,964	2,657,814
Remedial UST	21,804,491	3,162,616	2,861,636	2,396,342	2,216,230	1,894,259	1,735,939	1,513,708	1,283,732	1,072,432	3,667,597
Insurance AST	12,108,383	1,792,510	1,402,137	1,165,603	972,235	846,870	737,523	726,124	664,216	596,347	3,204,818
Remedial AST	2,750,457	607,760	408,706	265,726	158,977	111,483	187,996	196,524	156,765	137,847	518,674
Total	76,192,039	12,688,616	10,017,901	8,079,904	7,008,606	5,948,100	5,273,252	4,551,368	4,043,494	3,537,849	15,042,947
Percent of Current Total											
Paid by Year - Discounted	100.0%	16.7%	13.1%	10.6%	9.2%	7.8%	6.9%	6.0%	5.3%	4.6%	19.7%

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
ALAE Provision

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	PAID	INCURRED	PAID	ALAE PER \$10K	CASE		ALAE	ULTIMATE
<u>RY</u>	<u>LOSS</u>	<u>LOSS</u>	<u>ALAE</u>	<u>PAID LOSS</u>	<u>RESERVE</u>	<u>IBNR</u>	<u>UNPAID</u>	<u>ALAE</u>
1994	3,840,951	4,145,291	6,407	16.68	304,340	15,113	2,097	8,504
1995	4,157,462	4,210,487	9,365	22.53	53,025	28,766	537	9,902
1996	68,084,197	75,063,252	129,990	19.09	6,979,055	707,314	50,451	180,441
1997	18,082,067	19,005,008	42,182	23.33	922,940	127,147	6,892	49,075
1998	26,735,480	29,800,864	82,848	30.99	3,065,383	263,811	21,852	104,700
1999	23,225,460	24,699,219	75,330	32.43	1,473,758	310,423	11,711	87,041
2000	28,362,415	33,273,137	84,218	29.69	4,910,722	196,029	33,519	117,737
2001	13,112,484	16,154,987	52,749	40.23	3,042,503	146,008	20,928	73,677
2002	13,376,817	15,531,007	47,655	35.62	2,154,190	597,014	18,058	65,713
2003	10,229,919	11,995,739	54,630	53.40	1,765,819	582,616	15,414	70,045
2004	13,177,394	14,728,992	136,523	103.60	1,551,598	1,264,097	18,481	155,004
2005	8,915,837	10,825,449	108,280	121.45	1,909,612	751,126	17,464	125,744
2006	6,204,347	7,468,420	62,866	101.33	1,264,072	783,003	13,436	76,303
2007	8,801,198	9,648,495	97,508	110.79	847,297	1,255,207	13,800	111,308
2008	7,161,589	8,338,369	38,915	54.34	1,176,780	920,691	13,767	52,682
2009	5,060,502	6,136,229	29,082	57.47	1,075,727	1,000,268	13,626	42,708
2010	2,829,476	3,979,800	27,591	97.51	1,150,325	444,313	10,467	38,058
2011	5,679,153	7,877,099	30,898	54.41	2,197,946	1,250,597	22,635	53,534
2012	5,411,516	7,504,463	31,513	58.23	2,092,946	1,284,828	22,171	53,684
2013	5,023,032	6,619,698	27,062	53.88	1,596,666	1,621,540	21,123	48,186
2014	3,660,548	6,304,334	24,530	67.01	2,643,786	1,352,884	26,233	50,763
2015	4,973,053	7,177,048	40,547	81.53	2,203,996	2,629,310	31,724	72,272
2016	2,867,384	6,043,788	17,550	61.20	3,176,403	2,623,554	38,069	55,619
2017	2,939,088	8,012,948	23,550	80.13	5,073,860	3,170,007	54,110	77,660
2018	480,906	3,941,348	11,259	234.12	3,460,441	4,052,198	49,311	60,570
TOTAL ALL YEARS	292,392,274	348,485,468	1,293,047	44.22	56,093,194	27,377,866	547,880	1,840,928
		Wtd. Average 2008-2016		62.74				
		Wtd. Average 2008-2018		65.64				
		Straight Average All Years		65.64				
		Weighted Average All Years		44.22				

SELECTED RATIO	65.64
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Notes:

Col (5) = (4) / (3) x 10,000
Col (8) = [(6) + (7)] x Selected Ratio / 10,000
Col (9) = (8) + (4)

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
All Claim Types
ULAE Provision

(1)	(2)	(3)	(4)
FISCAL YEAR	TPA TOTAL FEES	FY PAID LOSS	AVERAGE FEES PER CY PAID
2004	2,451,360	13,739,514	0.178
2005	2,777,240	13,395,111	0.207
2006	2,895,762	12,847,713	0.225
2007	3,087,143	12,185,369	0.253
2008	3,124,118	15,806,387	0.198
2009	3,456,283	16,148,518	0.214
2010	3,289,570	14,134,856	0.233
2011	3,185,415	11,632,025	0.274
2012	3,188,828	12,461,529	0.256
2013	3,043,682	10,845,847	0.281
2014	3,116,377	10,116,592	0.308
2015	3,207,502	12,588,056	0.255
2016	3,255,111	13,762,021	0.237
2017	3,325,325	15,115,087	0.220
2018	2,918,491	13,127,399	0.243
Total	46,322,208	197,906,025	0.234
(7) 3-Year Average			0.233
(8) 5-Year Average			0.252
(9) 10-Year ex. Hi/Lo			0.250
(10) Selected			0.250
(11) [Case O/S + IBNR] x 70%			58,429,742
(12) ULAE IBNR = (10) x (11)			14,585,282
(13) Discount			1,271,897
(14) Discounted ULAE IBNR = (12) - (13)			13,313,386

Note: Total row in Column (4) reflects a weighted average.
FY 2018 value in Column (4) is adjusted to reflect a full year of data.

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	246,661	246,661	246,661	-	-	-
1995	241,953	241,953	241,953	-	-	-
1996	1,579,163	1,155,906	1,579,163	423,257	-	423,257
1997	1,995,927	1,995,927	1,995,927	-	-	-
1998	1,381,308	1,296,308	1,381,308	85,000	-	85,000
1999	142,573	142,573	142,573	-	-	-
2000	2,219,267	1,724,971	2,219,267	494,297	-	494,297
2001	1,081,236	996,294	1,081,236	84,942	-	84,942
2002	719,666	616,509	719,666	103,156	-	103,156
2003	2,190,077	1,645,324	2,190,077	544,753	-	544,753
2004	1,353,628	1,094,026	1,353,628	259,602	-	259,602
2005	1,160,547	844,136	1,160,547	316,412	-	316,412
2006	213,084	140,820	213,084	72,264	-	72,264
2007	2,961,629	2,297,257	2,488,778	191,520	472,851	664,371
2008	2,365,876	1,780,630	2,052,177	271,547	313,699	585,246
2009	1,240,247	743,523	1,240,247	496,725	-	496,725
2010	368,719	245,727	316,478	70,751	52,242	122,993
2011	2,859,924	1,793,765	2,064,707	270,942	795,217	1,066,159
2012	1,130,634	673,028	914,659	241,631	215,975	457,606
2013	294,002	162,643	231,563	68,921	62,439	131,360
2014	2,272,090	1,088,861	1,573,979	485,118	698,111	1,183,229
2015	3,703,062	1,569,832	2,292,174	722,342	1,410,888	2,133,230
2016	1,253,068	435,421	971,174	535,753	281,894	817,647
2017	3,540,070	851,011	1,479,562	628,551	2,060,508	2,689,059
2018	849,434	17,593	316,002	298,409	533,432	831,841
TOTAL	37,363,846	23,800,698	30,466,590	6,665,892	6,897,256	13,563,148

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Development of Losses to Ultimate

RY	Development Period in Months																		
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240
1994																			
1995					1.358	1.591	1.565	1.604	1.133	1.194	1.116	1.134	1.276	1.083	1.109	1.066	1.050	1.000	1.000
1996	2.098	1.106	1.151	1.889			1.122	1.025	1.000	1.272	1.000	1.366	1.049	1.032	1.091	1.082	1.016	1.000	1.000
1997	2.504	1.377	1.216	1.114	1.250	1.408	1.098	1.091	1.047	1.081	1.048	1.021	1.036	1.015	1.015	1.018	1.008	1.002	1.000
1998	2.695	1.438	1.290	1.798	1.112	1.037	1.063	1.235	1.015	1.063	1.019	1.007	1.015	1.003	1.024	1.076	1.009	1.044	1.013
1999		1.280	3.009	1.340	1.304	1.130	1.033	1.000	1.000	1.000	1.051	1.338	1.025	1.000	1.000	1.000	1.000	1.000	1.005
2000	3.172	1.271	1.381	1.569	1.028	1.029	1.029	1.000	1.037	1.008	1.014	1.107	1.052	1.000	1.028	1.040	1.000	1.006	1.005
2001	9.416	1.820	1.430	1.250	1.084	1.030	1.050	1.160	1.045	1.091	1.000	1.010	1.083	1.052	1.040	1.030	1.020	1.002	1.005
2002	14.784	1.513	1.247	1.168	1.278	1.063	1.032	1.155	1.050	1.057	1.006	1.070	1.047	1.000	1.003	1.012	1.006	1.002	1.005
2003	9.260	1.459	1.219	1.132	1.061	1.379	1.212	1.043	1.504	1.098	1.104	1.046	1.043	1.033	1.064	1.027	1.006	1.002	1.005
2004	1.643	1.382	1.103	1.442	1.231	1.095	1.286	1.072	1.121	1.050	1.255	1.147	1.097	1.229	1.022	1.027	1.006	1.002	1.005
2005	1.066	1.671	5.528	1.293	1.177	1.428	1.189	1.256	1.219	1.137	1.032	1.314	1.099	1.018	1.022	1.027	1.006	1.002	1.005
2006		1.000	1.000	6.470	1.171	1.049	1.000	1.000	1.369	1.067	1.211	1.120	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2007	13.702	1.333	1.254	1.076	1.120	1.072	1.054	1.010	1.170	1.034	1.022	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2008	1.316	1.096	1.028	1.066	1.055	1.037	1.093	1.155	1.059	1.027	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2009	4.004	1.255	1.467	1.039	1.050	1.036	1.017	1.024	1.055	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2010	17.254	1.587	1.461	1.027	1.172	1.072	1.205	1.049	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2011	5.534	1.347	1.215	1.179	1.094	1.119	1.021	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2012	3.464	2.126	1.414	1.190	1.404	1.089	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2013	1.409	1.931	1.151	1.115	1.446	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2014	19.137	1.226	1.156	1.068	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2015	5.264	1.996	1.271	1.130	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2016	28.197	1.598	1.220	1.130	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2017	1.359	1.445	1.220	1.130	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005
2018	11.607	1.445	1.220	1.130	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	-	-	-	-	43,694	43,694	43,694	43,694	53,694	66,694	66,694	76,832	93,580	111,486	111,486	132,821	138,273	138,273	155,391	178,532	178,532	194,724	220,213	246,661	246,661	251,165
1995	-	-	-	-	15,175	20,605	32,780	51,312	82,297	93,282	111,391	124,261	140,954	179,922	194,810	216,027	230,340	241,953	241,953	241,953	241,953	241,953	241,953	241,953	241,953	246,698
1996	60,606	127,123	140,605	161,781	305,670	364,732	394,527	442,597	453,495	453,495	576,781	576,781	787,820	826,524	853,309	930,849	1,007,552	1,023,213	1,023,213	1,068,112	1,082,062	1,090,678	1,155,906	1,157,826	1,159,364	1,180,532
1997	150,598	377,057	519,125	631,334	703,267	879,004	1,237,696	1,359,105	1,483,423	1,553,597	1,679,250	1,760,677	1,797,439	1,862,946	1,890,296	1,917,996	1,952,890	1,968,351	1,972,764	1,976,544	1,995,927	1,995,927	2,000,071	2,003,393	2,006,055	2,042,682
1998	71,919	193,815	278,696	359,433	646,106	718,507	745,388	792,136	978,580	992,873	1,055,025	1,075,457	1,082,693	1,099,371	1,105,031	1,125,278	1,115,534	1,126,074	1,280,060	1,296,308	1,296,308	1,299,673	1,302,371	1,304,534	1,306,268	1,330,118
1999	-	12,585	16,113	48,483	64,952	84,727	95,744	98,894	98,894	98,894	103,964	139,096	142,573	142,573	142,573	142,573	142,573	142,573	142,573	143,272	143,544	144,181	144,372	147,008	147,008	
2000	-	140,585	445,902	566,818	782,614	1,228,212	1,262,017	1,298,340	1,298,340	1,346,953	1,357,619	1,376,791	1,524,125	1,603,731	1,603,891	1,649,008	1,715,267	1,715,267	1,724,971	1,733,371	1,741,870	1,746,391	1,750,017	1,752,924	1,755,253	1,787,300
2001	16,703	157,277	286,137	408,158	511,400	554,458	571,001	599,455	695,506	726,601	792,933	792,933	801,191	867,543	912,396	948,559	976,545	996,294	998,261	1,003,123	1,008,041	1,010,657	1,012,756	1,014,438	1,015,786	1,034,332
2002	9,216	136,257	206,137	257,078	300,195	383,621	402,844	485,920	509,980	539,053	542,052	580,088	607,282	607,282	609,321	616,509	619,918	621,143	624,167	627,228	628,856	630,161	631,208	632,047	643,587	
2003	21,836	202,209	294,954	359,527	407,049	431,955	595,741	722,007	752,772	1,132,407	1,243,625	1,372,437	1,435,580	1,497,429	1,546,971	1,645,324	1,699,012	1,699,356	1,702,712	1,711,004	1,719,394	1,723,856	1,727,435	1,730,304	1,732,604	1,764,238
2004	71,257	117,103	161,795	178,485	257,392	316,743	346,872	446,145	478,479	536,422	563,361	707,282	811,449	890,246	1,094,026	1,118,001	1,148,366	1,154,716	1,156,997	1,162,631	1,168,332	1,171,364	1,173,796	1,175,745	1,177,308	1,198,803
2005	12,800	13,642	22,790	125,995	162,944	191,715	273,716	325,538	408,831	498,368	566,691	584,630	768,192	844,136	859,028	877,853	901,696	906,682	908,473	912,897	917,373	919,754	921,663	923,194	924,421	941,299
2006	-	8,947	8,947	57,884	67,789	71,084	71,084	71,084	97,281	103,765	125,694	140,820	148,712	151,335	154,652	158,852	159,731	160,046	160,825	161,614	162,033	162,370	162,640	162,856	165,829	
2007	58,988	808,267	1,077,402	1,350,931	1,454,130	1,628,782	1,745,892	1,840,192	1,838,776	2,174,856	2,247,778	2,297,257	2,514,971	2,655,920	2,702,778	2,762,008	2,877,025	2,852,712	2,858,346	2,872,265	2,886,349	2,893,840	2,904,665	2,908,524	2,961,629	
2008	750,154	987,266	1,081,739	1,111,591	1,185,280	1,249,946	1,296,178	1,417,026	1,636,341	1,733,534	1,780,630	1,835,148	2,009,067	2,121,664	2,159,095	2,206,411	2,266,338	2,278,869	2,294,489	2,305,740	2,311,724	2,316,524	2,320,371	2,323,454	2,365,876	
2009	81,174	324,978	407,777	598,236	621,700	652,756	676,540	688,297	704,856	743,523	767,004	790,487	865,402	913,903	930,027	950,408	976,222	981,620	983,558	988,348	993,194	995,772	997,839	999,496	1,000,825	1,019,098
2010	3,627	62,582	99,320	148,993	181,398	194,452	234,328	245,727	269,014	277,509	286,006	313,111	330,659	336,493	343,867	353,206	355,159	355,861	357,594	359,347	360,280	361,028	361,627	362,108	368,719	
2011	134,434	743,915	1,002,304	1,217,775	1,435,417	1,569,874	1,756,333	1,793,765	1,905,949	2,086,570	2,152,466	2,218,368	2,428,605	2,564,714	2,609,963	2,667,158	2,739,600	2,754,748	2,760,188	2,773,630	2,787,230	2,794,463	2,800,265	2,804,916	2,808,643	2,859,924
2012	35,519	123,028	261,546	369,814	440,068	617,743	673,028	709,142	753,492	824,898	850,949	877,003	960,117	1,013,927	1,031,815	1,054,427	1,083,065	1,089,054	1,091,205	1,096,519	1,101,895	1,104,755	1,107,049	1,108,887	1,110,361	1,130,634
2013	32,189	45,369	87,594	100,842	112,450	162,643	175,010	184,400	195,933	214,501	221,275	228,050	249,662	263,655	268,306	274,186	281,633	283,190	283,749	285,131	286,529	287,273	287,869	288,348	288,731	294,002
2014	37,615	719,825																								

Missouri Petroleum Storage Tank Insurance Fund
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Selection of Loss Development Factors

RY	Development Period in Months																								
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	
1994												Excluded													
1995					1.358	1.591	1.565	1.604	1.133	1.194	1.116	1.134	1.276	1.083	1.109	1.066	1.050	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
1996	2.098	1.106	1.151	1.889	1.193	1.082	1.122	1.025	1.000	1.272	1.000	1.366	1.049	1.032	1.091	1.082	1.016	1.000	1.044	1.013	1.008	1.060			
1997	2.504	1.377	1.216	1.114	1.250	1.408	1.098	1.091	1.047	1.081	1.048	1.021	1.036	1.015	1.015	1.018	1.008	1.002	1.002	1.010	1.000				
1998	2.695	1.438	1.290	1.798	1.112	1.037	1.063	1.235	1.015	1.063	1.019	1.007	1.015	1.003	1.024	1.076	1.009	1.044	1.013	1.000					
1999		1.280	3.009		1.304	1.130	1.033	1.000	1.000	1.000	1.051	1.338	1.025	1.000	1.000	1.000	1.000	1.000	1.000	1.000					
2000		3.172	1.271	1.561	1.381	1.028	1.029	1.000	1.037	1.008	1.014	1.107	1.052	1.000	1.028	1.040	1.000	1.006							
2001	9.416	1.820	1.430	1.250	1.084	1.030	1.050	1.160	1.045	1.091	1.000	1.010	1.083	1.052	1.040	1.030	1.020								
2002	14.784	1.513	1.247	1.168	1.278	1.063	1.032	1.155	1.050	1.057	1.006	1.070	1.047	1.000	1.003	1.012									
2003	9.260	1.459	1.219	1.132	1.061	1.379	1.212	1.043	1.504	1.098	1.104	1.046	1.043	1.033	1.064										
2004	1.643	1.382	1.103	1.442	1.231	1.095	1.286	1.072	1.121	1.050	1.255	1.147	1.097	1.229											
2005	1.066	1.671	5.528	1.293	1.177	1.428	1.189	1.256	1.219	1.137	1.032	1.314	1.099												
2006		1.000	1.000	6.470	1.171	1.049	1.000	1.000	1.369	1.067	1.211	1.120													
2007	13.702	1.333	1.254	1.076	1.120	1.072	1.054	1.010	1.170	1.034	1.022														
2008	1.316	1.096	1.028	1.066	1.055	1.037	1.093	1.155	1.059	1.027															
2009	4.004	1.255	1.467	1.039	1.050	1.036	1.017	1.024	1.055																
2010	17.254	1.587	1.461	1.027	1.217	1.072	1.205	1.049																	
2011	5.534	1.347	1.215	1.179	1.094	1.119	1.021																		
2012	3.464	2.126	1.414	1.190	1.404	1.089																			
2013	1.409	1.931	1.151	1.115	1.446																				
2014	19.137	1.226	1.156	1.068																					
2015	5.264	1.996	1.271																						
2016	28.197	1.598																							
2017	1.359																								
VOL WTD 3	2.313	1.585	1.220	1.101	1.182	1.108	1.034	1.106	1.108	1.032	1.031	1.214	1.072	1.085	1.045	1.032	1.007	1.021	1.006	1.008	1.003	1.049	1.000	NA	
VOL WTD 5	3.046	1.631	1.233	1.130	1.154	1.076	1.054	1.063	1.121	1.044	1.077	1.121	1.071	1.055	1.038	1.042	1.008	1.011	1.014	1.007	1.003	1.049	1.000	NA	
VOL WTD ALL	2.990	1.445	1.244	1.185	1.176	1.111	1.077	1.086	1.105	1.064	1.046	1.095	1.056	1.039	1.038	1.042	1.010	1.011	1.014	1.007	1.003	1.049	1.000	NA	
ARITH 3	11.607	1.607	1.193	1.124	1.315	1.093	1.081	1.076	1.095	1.042	1.088	1.194	1.080	1.087	1.036	1.027	1.007	1.017	1.005	1.008	1.003	1.030	1.000	NA	
ARITH 5	11.073	1.775	1.241	1.116	1.242	1.071	1.078	1.048	1.174	1.063	1.125	1.140	1.074	1.063	1.027	1.032	1.007	1.010	1.012	1.006	1.003	1.030	1.000	NA	
ARITH ALL	7.584	1.558	1.544	1.528	1.220	1.152	1.122	1.117	1.122	1.084	1.068	1.140	1.075	1.045	1.041	1.041	1.015	1.009	1.012	1.006	1.003	1.030	1.000	NA	
5 YR HI LO	8.603	1.842	1.214	1.120	1.238	1.066	1.056	1.028	1.149	1.050	1.116	1.113	1.076	1.028	1.024	1.027	1.006	1.003	1.005	1.005	1.000	NA	NA	NA	
7 YR HI LO	6.961	1.692	1.303	1.093	1.178	1.064	1.075	1.062	1.188	1.061	1.075	1.098	1.064	1.018	1.022	1.035	1.010	1.002	1.005	1.005	1.000	NA	NA	NA	
ALL YR HI LO	6.755	1.502	1.353	1.267	1.209	1.133	1.100	1.091	1.102	1.076	1.057	1.131	1.059	1.027	1.038	1.040	1.010	1.002	1.005	1.005	1.000	NA	NA	NA	
SELECTED	11.607	1.445	1.220	1.130	1.154	1.076	1.054	1.063	1.095	1.032	1.031	1.095	1.056	1.018	1.022	1.027	1.006	1.002	1.005	1.005	1.003	1.002	1.002	1.001	

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Paid Losses

	Development in Months																			
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	-	-	-	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694	43,694
1995	-	-	-	-	15,175	20,605	32,780	51,312	82,297	93,282	111,391	124,261	140,954	179,922	194,810	216,027	230,340	241,953	241,953	241,953
1996	60,606	127,123	140,605	161,781	305,670	364,732	394,527	442,597	453,495	453,495	576,781	576,781	787,820	826,524	853,309	930,849	1,007,552	1,023,213	1,023,213	1,068,112
1997	150,598	377,057	519,125	631,334	703,267	879,004	1,237,696	1,359,105	1,483,423	1,553,597	1,679,250	1,760,677	1,797,439	1,862,946	1,890,296	1,917,996	1,952,890	1,968,351	1,972,764	1,976,544
1998	71,919	193,815	278,696	359,433	646,106	718,507	745,388	792,136	978,580	992,873	1,055,025	1,075,457	1,082,693	1,099,371	1,103,031	1,129,278	1,215,534	1,226,074	1,280,060	1,296,308
1999	-	12,585	16,113	48,483	64,952	84,727	95,744	98,894	98,894	98,894	98,894	103,964	139,096	142,573	142,573	142,573	142,573	142,573	142,573	142,573
2000	-	140,585	445,902	566,818	782,614	1,238,212	1,262,017	1,296,340	1,298,340	1,346,953	1,357,619	1,376,791	1,524,125	1,603,731	1,603,891	1,649,008	1,715,267	1,715,267	1,724,971	1,724,971
2001	16,703	157,277	286,167	409,158	511,400	554,458	571,001	599,455	695,506	726,601	792,933	792,933	801,191	867,543	912,396	948,559	976,545	996,294		
2002	9,216	136,257	206,137	257,078	300,195	383,621	407,778	420,844	485,920	509,980	539,053	542,052	580,088	607,282	607,282	609,321	616,509			
2003	21,836	202,209	294,954	359,527	407,049	431,955	595,741	722,007	752,772	1,132,407	1,243,625	1,372,437	1,435,580	1,497,429	1,546,971	1,645,324				
2004	71,257	117,103	161,795	178,485	257,392	316,743	346,872	446,145	478,479	536,422	563,361	707,282	811,449	890,246	1,094,026					
2005	12,800	13,642	22,790	125,995	162,944	191,715	273,716	325,538	408,831	498,368	566,691	584,630	768,192	844,136						
2006	-	8,947	8,947	8,947	57,884	67,789	71,084	71,084	71,084	97,281	103,765	125,694	140,820							
2007	58,988	808,267	1,077,402	1,350,931	1,454,130	1,628,782	1,745,892	1,840,192	1,858,776	2,174,856	2,247,778	2,297,257								
2008	750,154	987,266	1,081,739	1,111,591	1,185,280	1,249,946	1,296,178	1,417,026	1,636,341	1,733,534	1,780,630									
2009	81,174	324,978	407,777	598,236	621,700	652,756	676,540	688,297	704,856	743,523										
2010	3,627	62,582	99,320	145,127	148,993	181,398	194,452	234,328	245,727											
2011	134,434	743,915	1,002,304	1,217,775	1,435,417	1,569,874	1,756,333	1,793,765												
2012	35,519	123,028	261,546	369,814	440,068	617,743	673,028													
2013	32,189	45,369	87,594	100,842	112,450	162,643														
2014	37,615	719,825	882,491	1,019,963	1,088,861															
2015	117,585	618,928	1,235,365	1,569,832																
2016	9,664	272,486	435,421																	
2017	626,145	851,011																		
2018	17,593																			

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	246,661	246,661	246,661	-	-	-
1995	241,953	241,953	241,953	-	-	-
1996	1,579,163	1,155,906	1,579,163	423,257	-	423,257
1997	1,995,927	1,995,927	1,995,927	-	-	-
1998	1,381,308	1,296,308	1,381,308	85,000	-	85,000
1999	142,573	142,573	142,573	-	-	-
2000	2,219,267	1,724,971	2,219,267	494,297	-	494,297
2001	1,084,938	996,294	1,081,236	84,942	3,703	88,644
2002	727,076	616,509	719,666	103,156	7,410	110,567
2003	2,242,938	1,645,324	2,190,077	544,753	52,861	597,614
2004	1,420,364	1,094,026	1,353,628	259,602	66,736	326,338
2005	1,246,652	844,136	1,160,547	316,412	86,105	402,517
2006	234,210	140,820	213,084	72,264	21,126	93,390
2007	2,870,172	2,297,257	2,488,778	191,520	381,394	572,914
2008	2,365,525	1,780,630	2,052,177	271,547	313,348	584,894
2009	1,445,591	743,523	1,240,247	496,725	205,344	702,069
2010	378,102	245,727	316,478	70,751	61,625	132,375
2011	2,611,670	1,793,765	2,064,707	270,942	546,963	817,905
2012	1,194,538	673,028	914,659	241,631	279,879	521,510
2013	325,579	162,643	231,563	68,921	94,016	162,937
2014	2,346,383	1,088,861	1,573,979	485,118	772,404	1,257,522
2015	3,727,382	1,569,832	2,292,174	722,342	1,435,207	2,157,550
2016	1,732,453	435,421	971,174	535,753	761,279	1,297,032
2017	2,874,069	851,011	1,479,562	628,551	1,394,507	2,023,057
2018	930,100	17,593	316,002	298,409	614,098	912,506
TOTAL	37,564,595	23,800,698	30,466,590	6,665,892	7,098,005	13,763,896

RY	Development Period in Months																										
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT		
1994																										1,000	
1995	1,000	1,000	1,813	1,217	0,548	1,278	1,777	0,919	0,822	1,000	1,000	1,143	1,107	1,000	1,000	1,000	0,923	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
1996	1,474	1,153	0,784	3,459	1,255	0,930	0,978	1,000	0,819	1,012	1,000	1,041	1,000	1,017	1,385	0,988	1,000	1,000	1,000	1,000	1,110	1,041	1,000	1,000	1,000	1,000	
1997	1,213	1,080	1,386	1,059	1,155	1,093	1,198	0,957	0,995	0,995	1,000	1,032	1,000	1,000	1,000	1,006	1,000	1,000	1,000	0,935	1,000	1,000	1,000	1,000	1,000	1,000	
1998	1,576	1,426	1,285	1,532	1,012	1,102	0,971	1,005	1,018	1,004	0,968	1,033	0,947	1,005	1,021	1,014	1,000	0,988	1,000	1,030	1,000	1,000	1,000	1,000	1,000	1,000	
1999	0,594	1,000	1,738	1,000	0,952	0,795	0,854	1,000	1,000	1,202	1,256	1,008	0,948	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2000	1,189	1,625	1,185	0,983	0,923	1,013	0,886	1,000	1,022	1,002	0,982	1,121	0,992	1,241	0,993	1,031	1,000	1,009	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2001	0,559	0,945	1,079	0,779	0,880	0,964	1,027	1,153	1,000	0,959	1,018	1,000	1,077	1,000	1,019	0,990	1,000	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2002	1,176	1,166	0,925	1,000	0,907	0,955	1,108	1,007	0,802	1,027	1,043	1,000	0,987	1,000	1,027	1,000	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2003	0,949	0,918	1,212	0,948	1,232	1,141	1,029	1,018	1,186	1,051	1,000	1,018	1,033	0,993	1,061	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2004	0,824	0,891	0,981	1,381	1,024	1,650	1,000	1,033	1,449	1,000	0,960	1,000	1,013	1,114	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2005	0,907	1,000	0,996	1,014	0,958	2,418	1,079	1,031	1,029	1,004	0,998	1,215	1,016	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2006	0,750	1,000	1,349	1,586	1,000	0,942	1,000	1,410	1,000	1,000	1,000	1,000	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2007	2,668	1,000	0,995	0,975	1,248	1,011	1,060	1,025	1,000	1,027	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2008	1,023	0,933	1,022	1,075	1,010	0,987	1,031	1,128	1,054	1,008	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2009	0,617	0,966	1,049	1,000	0,980	1,478	0,965	1,000	0,994	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2010	0,722	1,118	0,966	1,165	1,131	0,914	1,000	1,000	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2011	1,634	1,105	1,092	0,992	0,995	1,011	1,030	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2012	1,001	1,386	1,428	1,273	1,096	0,860	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2013	0,652	0,774	1,000	1,456	1,099	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2014	1,087	1,038	1,086	1,054	1,060	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2015	1,847	1,248	1,013	1,091	1,060	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2016	1,555	1,006	1,097	1,091	1,060	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2017	1,144	1,089	1,097	1,091	1,060	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
2018	1,515	1,089	1,097	1,091	1,060	1,077	1,032	1,059	1,025	1,011	1,000	1,049	1,023	1,024	1,025	1,014	1,007	1,003	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT	
1994	50,001	62,000	62,000	75,000	75,000	75,000	75,000	75,000	75,000	93,694	93,694	96,832	122,832	122,832	142,070	158,405	158,405	158,405	218,273	220,532	220,532	229,333	250,213	246,661	246,661	246,661	
1995	100,005	100,005	100,005	181,297	220,697	120,868	154,430	274,384	252,195	207,200	207,200	207,200	236,757	262,200	262,200	262,200	262,200	241,953	241,953	241,953	241,953	241,953	241,953	241,953	241,953	241,953	
1996	216,462	319,010	367,737	288,272	997,058	1,251,389	1,163,182	1,137,140	1,137,140	931,235	942,582	942,582	980,842	980,842	997,795	1,382,410	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,516,413	1,579,163	1,579,163	1,579,163	1,579,163	
1997	746,677	906,062	978,833	1,356,420	1,436,651	1,659,199	1,813,028	2,172,721	2,079,080	2,067,828	2,057,038	2,057,038	2,121,861	2,122,127	2,122,127	2,122,127	2,135,701	2,135,701	2,135,701	2,135,701	1,995,927	1,995,927	1,995,927	1,995,927	1,995,927	1,995,927	
1998	280,352	441,921	629,991	809,760	1,240,170	1,255,103	1,382,637	1,342,716	1,349,223	1,373,262	1,378,815	1,334,952	1,378,952	1,305,491	1,311,491	1,339,090	1,358,000	1,358,000	1,341,060	1,341,060	1,381,308	1,381,308	1,381,308	1,381,308	1,381,308	1,381,308	
1999	148,000	87,973	87,973	152,864	152,864	145,514	115,744	98,894	98,894	98,894	118,894	149,287	150,410	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	
2000	830,009	986,785	1,603,954	1,900,891	1,868,003	1,724,741	1,747,051	1,548,700	1,548,700	1,582,140	1,585,805	1,557,714	1,746,592	1,731,797	2,148,891	2,133,481	2,199,740	2,199,740	2,219,267	2,219,267	2,219,267	2,219,267	2,219,267	2,219,267	2,219,267	2,219,267	
2001	1,862,012	1,040,851	983,642	1,061,656	827,034	892,953	860,467	883,417	1,018,928	1,018,928	977,435	995,386	1,071,788	1,071,788	1,092,066	1,081,236	1,081,236	1,084,938	1,084,938	1,084,938	1,084,938	1,084,938	1,084,938	1,084,938	1,084,938	1,084,938	
2002	675,164	793,896	925,518	855,817	855,481	775,594	741,003	821,003	826,548	662,748	680,698	709,949	709,949	700,590	700,590	719,666	719,666	724,595	727,076	727,076	727,076	727,076	727,076	727,076	727,076	727,076	
2003	1,076,012	1,021,470	937,537	1,136,270	1,077,375	1,327,039	1,513,804	1,556,990	1,584,735	1,879,459	1,974,626	2,010,726	2,077,214	2,063,460	2,190,077	2,220,078	2,235,283	2,242,938	2,242,938	2,242,938	2,242,938	2,242,938	2,242,938	2,242,938	2,242,938	2,242,938	
2004	496,850	409,451	364,653	357,620	494,041	505,771	834,631	834,631	861,768	1,248,642	1,248,642	1,199,204	1,199,204	1,215,087	1,353,628	1,386,890	1,405,888	1,415,517	1,420,364	1,420,364	1,420,364	1,420,364	1,42				

Missouri Petroleum Storage Tank Insurance Fund
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RY	Development Period in Months																		240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228						228 - 240
1994												Excluded												
1995	1.000	1.000	1.813	1.217	0.548	1.278	1.777	0.919	0.822	1.000	1.000	1.143	1.107	1.000	1.000	1.000	0.923	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	1.474	1.153	0.784	3.459	1.255	0.930	0.978	1.000	0.819	1.012	1.000	1.041	1.000	1.017	1.385	0.988	1.000	1.000	1.000	1.000	1.000	1.110	1.041	
1997	1.213	1.080	1.386	1.059	1.155	1.093	1.198	0.957	0.995	0.995	1.000	1.032	1.000	1.000	1.000	1.006	1.000	1.000	1.000	1.000	0.935	1.000		
1998	1.576	1.426	1.285	1.532	1.012	1.102	0.971	1.005	1.018	1.004	0.968	1.033	0.947	1.005	1.021	1.014	1.000	0.988	1.000	1.030				
1999	0.594	1.000	1.738	1.000	0.952	0.795	0.854	1.000	1.000	1.202	1.256	1.008	0.948	1.000	1.000	1.000	1.000	1.000	1.000	1.000				
2000	1.189	1.625	1.185	0.983	0.923	1.013	0.886	1.000	1.022	1.002	0.982	1.121	0.992	1.241	0.993	1.031	1.000	1.009						
2001	0.559	0.945	1.079	0.779	1.080	0.964	1.027	1.153	1.000	0.959	1.018	1.000	1.077	1.000	1.019	0.990	1.000							
2002	1.176	1.166	0.925	1.000	0.907	0.955	1.108	1.007	0.802	1.027	1.043	1.000	0.987	1.000	1.027	1.000								
2003	0.949	0.918	1.212	0.948	1.232	1.141	1.029	1.018	1.186	1.051	1.000	1.018	1.033	0.993	1.061									
2004	0.824	0.891	0.981	1.381	1.024	1.650	1.000	1.033	1.449	1.000	0.960	1.000	1.013	1.114										
2005	0.907	1.000	0.996	1.014	0.958	2.418	1.079	1.031	1.029	1.004	0.998	1.215	1.016											
2006	0.750	1.000	1.349	1.586	1.000	0.942	1.000	1.410	1.000	1.000	1.000	1.000	1.000											
2007	2.668	1.000	0.995	0.975	1.248	1.011	1.060	1.025	1.000	1.027	1.000													
2008	1.023	0.933	1.022	1.075	1.010	0.987	1.031	1.128	1.054	1.008														
2009	0.617	0.966	1.049	1.000	0.980	1.478	0.965	1.000	0.994															
2010	0.722	1.118	0.966	1.165	1.131	0.914	1.000	1.000																
2011	1.634	1.105	1.092	0.992	0.995	1.011	1.030																	
2012	1.001	1.386	1.428	1.273	1.096	0.860																		
2013	0.652	0.774	1.000	1.456	1.099																			
2014	1.087	1.038	1.086	1.054																				
2015	1.847	1.248	1.013																					
2016	1.555	1.006																						
2017	1.144																							
VOL WTD 3	1.470	1.123	1.039	1.148	1.032	0.954	1.004	1.067	1.017	1.017	1.000	1.086	1.023	1.031	1.043	1.014	1.000	1.001	1.000	0.979	1.042	1.036	1.000	NA
VOL WTD 5	1.311	1.131	1.089	1.082	1.029	1.040	1.027	1.059	1.018	1.012	0.993	1.047	1.028	1.080	1.025	1.014	1.000	1.000	1.000	0.980	1.042	1.036	1.000	NA
VOL WTD ALL	1.129	1.089	1.097	1.091	1.060	1.077	1.032	1.026	1.025	1.011	0.997	1.049	1.008	1.049	1.052	1.008	0.998	1.000	1.000	0.980	1.042	1.036	1.000	NA
ARITH 3	1.515	1.097	1.033	1.261	1.063	0.928	0.998	1.043	1.016	1.012	0.999	1.072	1.021	1.036	1.007	1.000	0.999	1.000	0.988	1.037	1.021	1.000	NA	
ARITH 5	1.257	1.090	1.124	1.188	1.060	1.050	1.017	1.113	1.016	1.008	0.992	1.047	1.025	1.070	1.020	1.007	1.000	0.999	1.000	0.991	1.037	1.021	1.000	NA
ARITH ALL	1.137	1.081	1.161	1.247	1.032	1.141	1.058	1.043	1.013	1.021	1.017	1.051	1.011	1.037	1.056	1.004	0.989	0.999	1.000	0.991	1.037	1.021	1.000	NA
5 YR HI LO	1.262	1.097	1.064	1.164	1.063	0.971	1.020	1.051	1.010	1.004	0.999	1.006	1.021	1.038	1.015	1.005	1.000	1.000	1.000	1.000	1.000	NA	NA	NA
7 YR HI LO	1.284	1.103	1.048	1.113	1.066	0.973	1.024	1.043	1.054	1.013	1.003	1.028	1.008	1.024	1.013	1.002	1.000	1.000	1.000	1.000	1.000	NA	NA	NA
ALL YR HI LO	1.092	1.069	1.147	1.151	1.047	1.083	1.024	1.025	0.995	1.011	1.001	1.039	1.007	1.017	1.018	1.002	1.000	1.000	1.000	1.000	1.000	NA	NA	NA
SELECTED	1.515	1.089	1.097	1.091	1.060	1.077	1.032	1.059	1.025	1.011	1.000	1.049	1.023	1.024	1.025	1.014	1.007	1.003	1.000	1.000	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Incurred Losses

RY	Development in Months																											
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288				
1994	50,001	62,000	62,000	75,000	75,000	75,000	75,000	75,000	75,000	93,694	93,694	96,832	122,832	122,832	142,070	158,405	158,405	158,405	218,273	220,532	220,532	229,333	250,213	246,661				
1995	100,005	100,005	100,005	181,297	220,697	120,868	154,430	274,384	252,195	207,200	207,200	207,200	236,757	262,200	262,200	262,200	262,200	262,200	241,953	241,953	241,953	241,953	241,953	241,953				
1996	216,462	319,010	367,737	288,272	997,058	1,251,389	1,163,182	1,137,140	1,137,140	931,235	942,582	942,582	980,842	980,842	997,795	1,382,410	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,516,413	1,579,163					
1997	746,677	906,062	978,833	1,356,420	1,436,651	1,659,199	1,813,028	2,172,721	2,079,080	2,067,828	2,057,038	2,057,038	2,121,861	2,122,127	2,122,127	2,122,127	2,135,701	2,135,701	2,135,701	2,135,701	1,995,927	1,995,927						
1998	441,921	629,991	809,760	1,240,170	1,255,103	1,382,637	1,342,716	1,349,223	1,373,262	1,378,815	1,334,952	1,378,952	1,305,491	1,311,491	1,339,090	1,358,000	1,358,000	1,341,060	1,341,060	1,341,060	1,381,308							
1999	148,000	87,973	87,973	152,864	152,864	145,514	115,744	98,894	98,894	98,894	118,894	149,287	150,410	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573							
2000	830,009	986,785	1,603,954	1,900,891	1,868,003	1,724,741	1,747,051	1,548,700	1,548,700	1,582,140	1,585,805	1,557,714	1,746,592	1,731,797	2,148,891	2,133,481	2,199,740	2,199,740	2,199,740	2,219,267								
2001	1,862,012	1,040,851	983,642	1,061,656	827,034	892,953	860,467	883,417	1,018,928	1,018,928	977,435	995,386	995,386	1,071,788	1,071,788	1,092,066	1,081,236	1,081,236										
2002	675,164	793,896	925,518	855,817	855,481	775,594	741,003	821,003	826,548	662,748	680,698	709,949	709,949	700,590	700,590	719,666	719,666											
2003	1,076,012	1,021,470	937,537	1,136,270	1,077,375	1,327,039	1,513,804	1,556,990	1,584,735	1,879,459	1,974,626	1,974,626	2,010,726	2,077,214	2,063,460	2,190,077												
2004	496,850	409,451	364,653	357,620	494,041	505,771	834,631	834,631	861,768	1,248,642	1,248,642	1,199,204	1,199,204	1,215,087	1,353,628													
2005	386,006	350,003	350,003	348,601	353,601	338,873	819,445	884,264	911,289	937,852	941,848	940,095	1,141,835	1,160,547														
2006	100,001	75,001	75,001	101,150	160,447	160,447	151,084	151,084	213,084	213,084	213,084	213,084	213,084	213,084														
2007	682,440	1,820,729	1,821,179	1,812,130	1,767,555	2,205,757	2,230,289	2,364,750	2,424,277	2,424,277	2,488,778	2,488,778																
2008	1,588,551	1,624,832	1,516,553	1,550,168	1,666,353	1,682,424	1,660,446	1,711,851	1,930,604	2,035,727	2,052,177																	
2009	1,426,176	879,758	849,967	891,837	891,837	874,344	1,292,547	1,247,747	1,247,747	1,240,247																		
2010	337,003	243,262	272,086	262,819	306,255	346,255	316,478	316,478	316,478																			
2011	1,018,742	1,664,572	1,839,853	2,009,107	1,993,817	1,983,357	2,004,595	2,064,707																				
2012	385,065	385,438	534,218	762,801	970,701	1,063,470	914,659																					
2013	287,002	187,000	144,674	144,674	210,713	231,563																						
2014	1,217,768	1,324,230	1,374,411	1,493,061	1,573,979																							
2015	981,615	1,813,319	2,263,470	2,292,174																								
2016	621,269		971,174																									
2017	1,293,565	1,479,562																										
2018	316,002																											

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PURE</u> <u>PREMIUM</u>
2008	2,365,876	2,365,525	2,365,701	2,664	888
2009	1,240,247	1,445,591	1,342,919	2,662	504
2010	368,719	378,102	373,411	2,622	142
2011	2,859,924	2,611,670	2,735,797	2,623	1,043
2012	1,130,634	1,194,538	1,162,586	2,617	444
2013	294,002	325,579	309,791	2,603	119
2014	2,272,090	2,346,383	2,309,236	2,573	897
2015	3,703,062	3,727,382	3,715,222	2,530	1,468
2016	1,253,068	1,732,453	1,492,761	2,509	595
2017	3,540,070	2,874,069	3,207,069	2,489	1,288
2018	849,434	930,100	889,767	2,487	358
TOTAL	37,363,846	37,564,595	37,464,220	28,379	1,320

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	888	1,384	593	1,578,833	24.7%	390,555	1,780,630	2,171,186	2,052,177	119,009	271,547	815
2009	2,662	504	752	620	1,649,243	27.0%	445,973	743,523	1,189,496	1,240,247	(50,752)	496,725	447
2010	2,622	142	203	648	1,698,181	33.4%	566,457	245,727	812,183	316,478	495,706	70,751	310
2011	2,623	1,043	1,423	677	1,775,923	37.3%	662,051	1,793,765	2,455,816	2,064,707	391,110	270,942	936
2012	2,617	444	580	708	1,852,270	40.5%	749,677	673,028	1,422,705	914,659	508,046	241,631	544
2013	2,603	119	149	740	1,925,969	44.7%	860,520	162,643	1,023,163	231,563	791,599	68,921	393
2014	2,573	897	1,072	773	1,990,167	52.1%	1,036,413	1,088,861	2,125,274	1,573,979	551,295	485,118	826
2015	2,530	1,468	1,678	809	2,045,714	57.6%	1,178,479	1,569,832	2,748,311	2,292,174	456,136	722,342	1,086
2016	2,509	595	650	845	2,120,800	65.3%	1,383,857	435,421	1,819,278	971,174	848,103	535,753	725
2017	2,489	1,288	1,347	884	2,199,372	76.0%	1,670,656	851,011	2,521,667	1,479,562	1,042,105	628,551	1,013
2018	2,487	358	358	924	2,297,334	97.9%	2,249,752	17,593	2,267,346	316,002	1,951,344	298,409	912
TOTAL	28,379				21,133,807		11,194,390	9,362,034	20,556,424	13,452,723	7,103,701	4,090,689	724
	<u>Pure Premium Selection</u>				Trend =	1.045							
	3-Year Average x Latest		1,225										
	5-Year Average x Latest		979										
	All Year Average x Latest		924										
	Selected Pure Premium		924										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Release
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	888	1,384	593	1,578,833	13.2%	209,139	2,052,177	2,261,316	1,780,630	480,686	271,547	849
2009	2,662	504	752	620	1,649,243	14.2%	234,272	1,240,247	1,474,520	743,523	730,997	496,725	554
2010	2,622	142	203	648	1,698,181	16.3%	276,776	316,478	593,254	245,727	347,527	70,751	226
2011	2,623	1,043	1,423	677	1,775,923	20.9%	371,932	2,064,707	2,436,639	1,793,765	642,874	270,942	929
2012	2,617	444	580	708	1,852,270	23.4%	433,985	914,659	1,348,644	673,028	675,616	241,631	515
2013	2,603	119	149	740	1,925,969	28.9%	556,153	231,563	787,717	162,643	625,074	68,921	303
2014	2,573	897	1,072	773	1,990,167	32.9%	655,142	1,573,979	2,229,120	1,088,861	1,140,259	485,118	866
2015	2,530	1,468	1,678	809	2,045,714	38.5%	787,691	2,292,174	3,079,865	1,569,832	1,510,033	722,342	1,217
2016	2,509	595	650	845	2,120,800	43.9%	931,927	971,174	1,903,102	435,421	1,467,681	535,753	759
2017	2,489	1,288	1,347	884	2,199,372	48.5%	1,067,142	1,479,562	2,546,704	851,011	1,695,693	628,551	1,023
2018	2,487	358	358	924	2,297,334	66.0%	1,516,814	316,002	1,832,816	17,593	1,815,222	298,409	737
TOTAL	28,379				21,133,807		7,040,973	13,452,723	20,493,696	9,362,034	11,131,662	4,090,689	722
	<u>Pure Premium Selection</u>				Trend =	1.045							
	3-Year Average x Latest		1,225										
	5-Year Average x Latest		979										
	All Year Average x Latest		924										
	Selected Pure Premium		924										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	875,960	731,314	875,960	144,646	-	144,646
1995	830,629	830,629	830,629	-	-	-
1996	3,961,729	3,847,779	3,883,098	35,320	78,631	113,951
1997	4,642,882	4,402,894	4,642,882	239,988	-	239,988
1998	5,363,065	5,023,106	5,363,065	339,959	-	339,959
1999	9,777,667	9,232,961	9,576,992	344,031	200,676	544,706
2000	5,728,071	5,331,739	5,687,601	355,862	40,470	396,333
2001	2,323,281	2,128,279	2,255,449	127,170	67,832	195,002
2002	4,676,253	4,208,501	4,388,828	180,327	287,425	467,752
2003	3,471,849	3,063,698	3,379,908	316,210	91,940	408,150
2004	2,448,871	2,113,648	2,304,758	191,110	144,113	335,223
2005	2,727,699	2,309,907	2,667,437	357,530	60,262	417,793
2006	1,568,383	1,243,210	1,568,383	325,173	-	325,173
2007	4,243,288	3,449,564	3,753,895	304,331	489,393	793,724
2008	3,068,621	2,441,800	2,968,102	526,301	100,520	626,821
2009	2,385,549	1,818,009	2,023,386	205,377	362,164	567,540
2010	1,950,285	1,416,703	1,825,960	409,256	124,325	533,582
2011	2,059,681	1,439,764	1,605,837	166,073	453,845	619,918
2012	2,966,883	2,007,539	2,897,254	889,715	69,629	959,344
2013	3,947,335	2,514,517	3,178,441	663,925	768,894	1,432,818
2014	3,016,161	1,774,763	2,861,330	1,086,567	154,831	1,241,398
2015	3,040,122	1,527,986	1,972,587	444,600	1,067,535	1,512,135
2016	2,304,864	984,252	1,977,045	992,792	327,819	1,320,612
2017	2,543,316	768,576	2,028,988	1,260,412	514,328	1,774,740
2018	2,245,872	211,847	1,101,470	889,623	1,144,402	2,034,025
TOTAL	82,168,319	64,822,984	75,619,285	10,796,300	6,549,034	17,345,335

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Development of Losses to Ultimate

RY	Development Period in Months																			ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT	
1994																									1,019	
1995	1.931	1.289	1.132	1.533	1.023	1.266	1.393	1.005	1.040	1.013	1.043	1.008	1.000	1.010	1.000	1.000	1.028	1.000	1.000	1.036	1.000	1.000	1.000	1.005	1.019	
1996	1.951	1.854	1.381	1.832	1.102	1.078	1.026	1.059	1.034	1.034	1.022	1.015	1.052	1.015	1.018	1.008	1.011	1.004	1.023	1.009	1.008	1.008	1.006	1.005	1.019	
1997	5.932	1.929	1.608	1.303	1.185	1.275	1.075	1.043	1.055	1.059	1.023	1.040	1.051	1.045	1.019	1.014	1.016	1.050	1.021	1.014	1.007	1.007	1.006	1.005	1.019	
1998	5.396	1.373	1.182	1.137	1.047	1.093	1.057	1.077	1.068	1.091	1.022	1.062	1.028	1.009	1.026	1.015	1.047	1.054	1.027	1.025	1.009	1.007	1.006	1.005	1.019	
1999	3.145	1.413	1.151	1.230	1.119	1.083	1.082	1.054	1.045	1.051	1.035	1.034	1.044	1.017	1.015	1.021	1.022	1.010	1.010	1.012	1.009	1.007	1.006	1.005	1.019	
2000	2.794	1.171	1.209	1.059	1.096	1.051	1.035	1.083	1.030	1.048	1.022	1.069	1.019	1.023	1.018	1.027	1.028	1.013	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2001	1.379	1.610	1.131	1.121	1.052	1.061	1.021	1.044	1.031	1.037	1.057	1.024	1.013	1.024	1.018	1.023	1.030	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2002	2.952	1.311	1.160	1.055	1.048	1.343	1.023	1.026	1.012	1.018	1.028	1.020	1.012	1.019	1.032	1.000	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2003	2.242	1.245	1.134	1.118	1.091	1.096	1.060	1.025	1.029	1.042	1.015	1.027	1.006	1.016	1.044	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2004	6.475	1.290	1.079	1.064	1.094	1.117	1.039	1.023	1.013	1.082	1.016	1.028	1.024	1.007	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2005	2.800	1.295	1.163	1.080	1.079	1.006	1.039	1.058	1.049	1.027	1.016	1.110	1.038	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2006	3.574	1.540	1.136	1.366	1.032	1.073	1.086	1.027	1.001	1.027	1.000	1.003	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2007	4.897	1.574	1.091	1.110	1.096	1.059	1.011	1.071	1.089	1.037	1.041	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2008	3.181	1.294	1.214	1.216	1.094	1.068	1.037	1.047	1.057	1.049	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019		
2009	4.550	1.176	1.057	1.032	1.024	1.028	1.025	1.018	1.008	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2010	9.898	1.200	1.190	1.142	1.092	1.042	1.038	1.055	1.049	1.044	1.022	1.025	1.016	1.019	1.038	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019
2011	2.092	1.360	1.105	1.049	1.034	1.106	1.077	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2012	2.259	1.678	1.189	1.204	1.119	1.072	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2013	2.154	1.421	1.329	1.240	1.184	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2014	7.132	1.486	1.179	1.112	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2015	10.893	2.283	1.132	1.171	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2016	3.832	1.726	1.177	1.171	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2017	3.572	1.413	1.177	1.171	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
2018	3.204	1.413	1.177	1.171	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	1.019	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	17,096	27,184	34,895	95,084	132,148	132,148	149,193	202,874	336,027	379,362	457,817	479,155	517,191	527,042	529,376	583,342	631,688	632,598	669,990	690,824	690,824	722,650	724,556	724,556	731,314	744,994
1995	89,034	171,911	221,544	250,710	384,248	393,149	497,892	693,726	697,392	725,043	734,723	766,019	772,311	772,311	779,668	779,668	779,668	801,569	801,569	801,569	830,629	830,629	830,629	830,629	834,571	850,184
1996	248,435	484,694	898,742	1,241,483	2,274,586	2,506,109	2,700,383	2,769,493	2,933,288	3,033,001	3,134,874	3,203,100	3,252,258	3,422,969	3,474,090	3,537,955	3,565,408	3,605,861	3,620,092	3,703,617	3,785,792	3,818,767	3,847,779	3,870,606	3,888,977	3,961,729
1997	72,267	428,681	827,136	1,330,215	1,733,340	2,054,451	2,619,485	2,814,896	2,935,198	3,095,331	3,278,812	3,354,318	3,489,099	3,666,009	3,832,033	3,903,871	3,957,587	4,020,225	4,222,873	4,309,814	4,370,558	4,402,894	4,435,545	4,461,860	4,483,037	4,566,902
1998	244,191	1,317,603	1,806,685	2,137,859	2,431,813	2,545,169	2,781,548	2,941,195	3,167,671	3,383,414	3,689,967	3,771,262	4,003,931	4,114,580	4,152,017	4,258,947	4,324,127	4,527,913	4,773,615	4,900,838	5,023,106	5,069,670	5,107,266	5,137,566	5,161,950	5,258,516
1999	786,810	2,474,382	3,496,322	4,023,648	4,948,985	5,540,026	6,001,712	6,496,501	6,850,066	7,158,107	7,522,683	7,784,778	8,050,943	8,403,872	8,550,000	8,674,721	8,858,161	9,049,576	9,137,364	9,339,947	9,426,527	9,496,433	9,552,773	9,598,113	9,777,667	
2000	738,273	2,062,618	2,415,497	2,919,665	3,092,893	3,389,522	3,561,543	3,685,610	3,990,320	4,108,957	4,305,211	4,399,521	4,703,612	4,793,636	4,902,861	4,988,988	5,122,239	5,263,743	5,331,739	5,408,965	5,471,641	5,522,362	5,563,315	5,596,321	5,622,882	5,728,071
2001	493,157	680,163	1,095,144	1,238,075	1,388,175	1,460,247	1,549,347	1,581,683	1,652,001	1,702,772	1,766,170	1,865,996	1,911,094	1,936,133	1,983,119	2,018,978	2,065,730	2,128,279	2,162,530	2,193,853	2,219,274	2,239,846	2,256,457	2,269,884	2,280,617	2,323,281
2002	523,306	1,545,046	2,024,839	2,349,790	2,479,316	2,598,612	3,489,397	3,570,739	3,663,170	3,707,244	3,775,271	3,880,256	3,958,320	4,004,981	4,079,843	4,208,501	4,208,501	4,283,757	4,352,698	4,415,743	4,466,910	4,508,318	4,541,751	4,568,696	4,590,380	4,676,253
2003	558,641	1,252,492	1,559,919	1,768,858	1,977,267	2,157,660	2,363,773	2,505,098	2,568,104	2,643,427	2,753,678	2,887,346	2,934,085	3,063,698	3,124,570	3,180,442	3,231,627	3,278,435	3,316,423	3,347,166	3,371,988	3,391,993	3,408,093	3,471,849		
2004	143,829	931,294	1,201,475	1,296,399	1,379,054	1,509,347	1,686,522	1,752,111	1,791,788	1,815,522	1,963,819	1,994,768	2,050,897	2,099,609	2,113,648	2,160,982	2,203,918	2,243,328	2,279,431	2,312,446	2,339,242	2,360,926	2,378,435	2,392,545	2,403,901	2,448,871
2005	337,211	944,193	1,222,262	1,421,775	1,535,499	1,656,178	1,665,460	1,730,844	1,831,040	1,920,466	1,971,656	2,004,142	2,224,850	2,309,907	2,354,307	2,407,031	2,454,855	2,498,752	2,538,966	2,575,741	2,605,587	2,629,741	2,649,243	2,664,960	2,677,608	2,727,699
2006	114,292	408,515	629,120	714,825	976,707	1,008,090	1,081,296	1,174,274	1,206,522	1,207,387	1,239,850	1,239,850	1,243,210	1,263,367	1,287,652	1,316,488	1,342,645	1,366,654	1,388,648	1,408,761	1,425,085	1,438,296	1,448,862	1,457,558	1,464,476	1,491,873
2007	249,922	1,223,865	1,926,859	2,102,500	2,736,792	2,559,689	2,711,518	2,740,693	2,935,041	3,195,238	3,312,186	3,449,564	3,536,025	3,593,358	3,662,429	3,744,447	3,818,844	3,887,132	3,949,690	4,006,898	4,053,327	4,090,901	4,121,239	4,145,689	4,165,365	4,243,288
2008	285,783	909,119	1,176,82																							

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Selection of Loss Development Factors

RY	Development Period in Months																								
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	
1994												Excluded													
1995	1.931	1.289	1.132	1.533	1.023	1.266	1.393	1.005	1.040	1.013	1.043	1.008	1.000	1.010	1.000	1.000	1.028	1.000	1.000	1.036	1.000	1.000	1.000	1.000	
1996	1.951	1.854	1.381	1.832	1.102	1.078	1.026	1.059	1.034	1.034	1.022	1.015	1.052	1.015	1.018	1.008	1.011	1.004	1.023	1.022	1.009	1.008			
1997	5.932	1.929	1.608	1.303	1.185	1.275	1.075	1.043	1.055	1.059	1.023	1.040	1.051	1.045	1.019	1.014	1.016	1.050	1.021	1.014	1.007				
1998	5.396	1.373	1.182	1.137	1.047	1.093	1.057	1.077	1.068	1.091	1.022	1.062	1.028	1.009	1.026	1.015	1.047	1.054	1.027	1.025					
1999	3.145	1.413	1.151	1.230	1.119	1.083	1.082	1.054	1.045	1.051	1.035	1.034	1.044	1.017	1.015	1.021	1.022	1.010	1.010						
2000	2.794	1.171	1.209	1.059	1.096	1.051	1.035	1.083	1.030	1.048	1.022	1.069	1.019	1.023	1.018	1.027	1.028	1.013							
2001	1.379	1.610	1.131	1.121	1.052	1.061	1.021	1.044	1.031	1.037	1.057	1.024	1.013	1.024	1.018	1.018	1.023	1.030							
2002	2.952	1.311	1.160	1.055	1.048	1.343	1.023	1.026	1.012	1.018	1.028	1.020	1.012	1.019	1.032	1.000									
2003	2.242	1.245	1.134	1.118	1.091	1.096	1.060	1.025	1.029	1.042	1.015	1.027	1.006	1.016	1.044										
2004	6.475	1.290	1.079	1.064	1.094	1.117	1.039	1.023	1.013	1.082	1.016	1.028	1.024	1.007											
2005	2.800	1.295	1.163	1.080	1.079	1.006	1.039	1.058	1.049	1.027	1.016	1.110	1.038												
2006	3.574	1.540	1.136	1.366	1.032	1.073	1.086	1.027	1.001	1.027	1.000	1.003													
2007	4.897	1.574	1.091	1.110	1.096	1.059	1.011	1.071	1.089	1.037	1.041														
2008	3.181	1.294	1.214	1.216	1.094	1.068	1.037	1.047	1.057	1.049															
2009	4.550	1.176	1.057	1.032	1.024	1.028	1.025	1.018	1.008																
2010	9.898	1.200	1.190	1.142	1.092	1.042	1.038	1.055																	
2011	2.092	1.360	1.105	1.049	1.034	1.106	1.077																		
2012	2.259	1.678	1.189	1.204	1.119	1.072																			
2013	2.154	1.421	1.329	1.240	1.184																				
2014	7.132	1.486	1.179	1.112																					
2015	10.893	2.283	1.132																						
2016	3.832	1.726																							
2017	3.572																								
VOL WTD 3	4.614	1.779	1.211	1.186	1.127	1.073	1.045	1.039	1.058	1.039	1.026	1.053	1.021	1.015	1.033	1.016	1.025	1.021	1.017	1.021	1.007	1.006	1.000	NA	
VOL WTD 5	3.876	1.672	1.190	1.157	1.100	1.062	1.033	1.047	1.049	1.044	1.022	1.036	1.017	1.019	1.022	1.018	1.027	1.023	1.017	1.021	1.007	1.006	1.000	NA	
VOL WTD ALL	3.204	1.413	1.177	1.171	1.093	1.103	1.052	1.050	1.040	1.047	1.027	1.040	1.030	1.019	1.022	1.016	1.025	1.023	1.017	1.021	1.007	1.006	1.000	NA	
ARITH 3	6.099	1.831	1.213	1.185	1.113	1.073	1.047	1.040	1.051	1.037	1.019	1.047	1.023	1.014	1.031	1.017	1.027	1.026	1.019	1.020	1.005	1.004	1.000	NA	
ARITH 5	5.517	1.719	1.187	1.149	1.091	1.063	1.038	1.044	1.041	1.044	1.018	1.038	1.018	1.018	1.025	1.017	1.028	1.026	1.016	1.024	1.005	1.004	1.000	NA	
ARITH ALL	4.132	1.478	1.188	1.200	1.085	1.106	1.066	1.045	1.037	1.044	1.026	1.037	1.026	1.018	1.021	1.013	1.026	1.022	1.016	1.024	1.005	1.004	1.000	NA	
5 YR HI LO	4.845	1.630	1.167	1.153	1.082	1.061	1.033	1.043	1.038	1.037	1.016	1.025	1.016	1.019	1.022	1.020	1.027	1.024	1.018	1.024	1.007	NA	NA	NA	
7 YR HI LO	3.790	1.534	1.159	1.145	1.087	1.063	1.043	1.042	1.031	1.036	1.023	1.034	1.021	1.017	1.022	1.016	1.025	1.019	1.018	1.024	1.007	NA	NA	NA	
ALL YR HI LO	3.941	1.453	1.173	1.174	1.083	1.098	1.048	1.045	1.036	1.042	1.026	1.033	1.026	1.017	1.021	1.014	1.025	1.019	1.018	1.024	1.007	NA	NA	NA	
SELECTED	3.204	1.413	1.177	1.171	1.083	1.062	1.033	1.039	1.049	1.044	1.022	1.025	1.016	1.019	1.022	1.020	1.018	1.016	1.014	1.012	1.009	1.007	1.006	1.005	

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Paid Losses

	Development in Months																								
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	
1994	17,096	27,184	34,895	95,084	132,148	132,148	149,193	202,874	336,027	379,362	457,817	479,155	517,191	527,042	529,376	583,342	631,688	632,598	669,990	690,824	690,824	722,650	724,556	724,556	
1995	89,034	171,911	221,544	250,710	384,248	393,149	497,892	693,726	697,392	725,043	734,723	766,019	772,311	772,311	779,668	779,668	779,668	801,569	801,569	801,569	830,629	830,629	830,629	830,629	
1996	248,435	484,694	898,742	1,241,483	2,274,586	2,506,109	2,700,383	2,769,493	2,933,288	3,033,001	3,134,874	3,203,100	3,252,258	3,422,969	3,474,090	3,537,955	3,565,408	3,605,861	3,620,092	3,703,617	3,785,792	3,818,767	3,847,779	3,847,779	
1997	72,267	428,681	827,136	1,330,215	1,733,340	2,054,451	2,619,485	2,814,896	2,935,198	3,095,331	3,278,812	3,354,318	3,489,099	3,666,009	3,832,033	3,903,871	3,957,587	4,020,225	4,222,873	4,309,814	4,370,558	4,402,894			
1998	244,191	1,317,603	1,808,685	2,137,859	2,431,813	2,545,169	2,781,548	2,941,195	3,167,671	3,383,414	3,689,967	3,771,262	4,003,931	4,114,580	4,152,017	4,258,947	4,324,127	4,527,913	4,773,615	4,900,838	5,023,106				
1999	786,810	2,474,382	3,496,322	4,023,648	4,948,985	5,540,026	6,001,712	6,496,501	6,850,066	7,158,107	7,522,683	7,784,778	8,050,943	8,403,872	8,550,000	8,674,731	8,858,161	9,049,576	9,137,364	9,232,961					
2000	738,273	2,062,618	2,415,497	2,919,665	3,092,893	3,389,522	3,561,543	3,685,610	3,990,320	4,108,957	4,305,211	4,399,521	4,703,612	4,793,636	4,902,861	4,988,988	5,122,239	5,263,743	5,331,739						
2001	493,157	680,163	1,095,144	1,238,075	1,388,175	1,460,247	1,549,347	1,581,683	1,652,001	1,702,772	1,766,170	1,865,996	1,911,094	1,936,133	1,983,119	2,018,978	2,065,730	2,128,279							
2002	523,306	1,545,046	2,024,839	2,349,790	2,479,316	2,598,612	3,489,397	3,570,739	3,663,170	3,707,244	3,775,271	3,880,256	3,958,320	4,004,981	4,079,843	4,208,501	4,208,501								
2003	558,641	1,252,492	1,559,919	1,768,858	1,977,267	2,157,660	2,363,773	2,505,098	2,568,104	2,643,427	2,753,678	2,796,043	2,871,359	2,887,346	2,934,085	3,063,698									
2004	143,829	931,294	1,201,475	1,296,399	1,379,054	1,509,347	1,686,522	1,752,111	1,791,788	1,815,522	1,963,819	1,994,768	2,050,897	2,099,609	2,113,648										
2005	337,211	944,193	1,222,262	1,421,775	1,535,499	1,656,178	1,665,460	1,730,844	1,831,040	1,920,466	1,971,656	2,004,142	2,224,850	2,309,907											
2006	114,292	408,515	629,120	714,825	976,707	1,008,090	1,081,296	1,174,274	1,206,522	1,207,387	1,239,850	1,239,850	1,243,210												
2007	249,922	1,223,865	1,926,859	2,102,500	2,334,792	2,559,689	2,711,518	2,740,693	2,935,041	3,195,238	3,312,186	3,449,564													
2008	285,783	909,119	1,176,822	1,428,082	1,736,851	1,899,675	2,029,161	2,105,246	2,203,792	2,328,660	2,441,800														
2009	281,383	1,280,215	1,505,006	1,590,623	1,641,266	1,680,809	1,727,791	1,771,068	1,803,131	1,818,009															
2010	70,430	697,094	836,490	995,262	1,136,718	1,241,412	1,293,850	1,342,840	1,416,703																
2011	354,238	741,233	1,008,015	1,114,183	1,168,623	1,208,286	1,336,441	1,439,764																	
2012	308,280	696,402	1,168,776	1,389,447	1,672,985	1,872,897	2,007,539																		
2013	420,803	906,448	1,288,052	1,711,865	2,123,471	2,514,517																			
2014	127,794	911,475	1,354,211	1,596,521	1,774,763																				
2015	54,289	591,352	1,349,945	1,527,986																					
2016	148,859	570,416	984,252																						
2017	215,178	768,576																							
2018	211,847																								

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	875,960	731,314	875,960	144,646	-	144,646
1995	830,629	830,629	830,629	-	-	-
1996	3,883,098	3,847,779	3,883,098	35,320	-	35,320
1997	4,642,882	4,402,894	4,642,882	239,988	-	239,988
1998	5,363,065	5,023,106	5,363,065	339,959	-	339,959
1999	9,576,992	9,232,961	9,576,992	344,031	-	344,031
2000	5,715,439	5,331,739	5,687,601	355,862	27,838	383,700
2001	2,277,058	2,128,279	2,255,449	127,170	21,609	148,779
2002	4,486,171	4,208,501	4,388,828	180,327	97,343	277,670
2003	3,454,424	3,063,698	3,379,908	316,210	74,515	390,725
2004	2,399,803	2,113,648	2,304,758	191,110	95,046	286,156
2005	2,786,378	2,309,907	2,667,437	357,530	118,941	476,472
2006	1,634,727	1,243,210	1,568,383	325,173	66,344	391,517
2007	4,003,475	3,449,564	3,753,895	304,331	249,580	553,912
2008	3,195,561	2,441,800	2,968,102	526,301	227,459	753,760
2009	2,172,775	1,818,009	2,023,386	205,377	149,389	354,766
2010	2,032,235	1,416,703	1,825,960	409,256	206,275	615,532
2011	1,813,826	1,439,764	1,605,837	166,073	207,989	374,062
2012	3,282,856	2,007,539	2,897,254	889,715	385,602	1,275,317
2013	3,702,844	2,514,517	3,178,441	663,925	524,403	1,188,327
2014	3,396,379	1,774,763	2,861,330	1,086,567	534,948	1,621,516
2015	2,419,470	1,527,986	1,972,587	444,600	446,884	891,484
2016	2,514,485	984,252	1,977,045	992,792	537,441	1,530,233
2017	2,859,618	768,576	2,028,988	1,260,412	830,630	2,091,042
2018	2,375,350	211,847	1,101,470	889,623	1,273,880	2,163,503
TOTAL	81,695,400	64,822,984	75,619,285	10,796,300	6,076,116	16,872,416

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Development of Losses to Ultimate

RY	Development Period in Months																				ULT					
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT	
1994																										1,000
1995	1,568	0,944	0,990	1,403	1,380	1,130	1,006	1,003	1,165	0,989	0,963	1,000	1,033	0,953	1,000	1,000	1,025	1,000	1,000	1,001	1,000	1,000	1,000	1,000	1,000	1,000
1996	1,115	1,062	1,088	1,277	0,983	1,123	0,973	1,014	0,948	1,021	1,057	0,930	1,031	1,011	1,001	1,010	0,996	1,014	1,035	1,000	1,000	0,999	1,000	1,000	1,000	1,000
1997	1,358	1,029	1,121	1,190	0,932	1,009	1,006	0,952	1,008	0,940	1,007	1,030	1,036	1,012	1,029	1,005	1,037	1,023	1,004	0,983	1,007	1,000	1,000	1,000	1,000	1,000
1998	0,968	1,227	0,936	1,000	1,053	1,001	0,983	1,009	1,012	1,045	1,014	1,016	1,012	1,008	0,997	0,993	1,066	1,050	1,011	1,007	1,000	1,000	1,000	1,000	1,000	1,000
1999	1,377	1,174	1,037	1,067	1,059	1,019	1,058	0,998	1,115	1,038	1,005	1,043	0,997	1,000	1,009	1,002	0,974	0,971	0,999	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2000	1,307	1,026	1,352	1,020	0,960	1,014	0,989	0,994	1,014	1,019	1,004	1,023	1,021	1,000	1,039	1,011	1,018	1,002	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2001	0,774	1,045	1,094	0,950	1,013	1,048	0,988	1,032	1,007	1,037	1,006	1,014	0,990	1,000	1,031	1,000	1,011	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2002	1,086	1,231	1,061	0,999	1,008	1,176	0,980	1,001	1,007	1,022	1,019	0,998	0,985	1,015	1,013	0,987	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2003	0,866	1,069	1,034	1,077	0,986	0,979	0,990	0,992	1,055	0,996	1,003	1,003	1,011	1,035	1,050	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2004	0,726	1,002	0,957	1,153	0,996	0,915	1,012	1,022	1,037	1,008	1,020	1,029	1,000	0,997	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2005	0,999	1,065	0,965	0,916	1,003	0,977	1,047	1,044	0,963	0,984	1,044	1,127	0,982	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2006	0,697	0,925	1,016	1,121	0,979	0,945	0,958	1,009	0,962	0,985	1,000	1,105	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2007	1,129	0,948	0,943	0,962	1,063	1,019	1,010	1,028	1,090	1,012	1,005	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2008	0,720	0,880	1,052	1,089	1,010	1,024	0,994	1,105	1,066	1,000	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2009	0,825	0,842	0,957	1,023	0,974	1,022	0,998	1,008	1,073	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2010	0,696	0,928	0,970	1,076	1,062	1,073	1,007	0,983	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2011	0,832	1,000	1,031	0,966	1,093	1,020	1,004	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2012	0,858	0,963	1,329	1,028	0,996	1,035	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2013	0,764	1,126	1,009	0,996	1,083	1,028	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2014	0,746	1,081	0,949	1,207	1,019	1,028	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2015	2,616	1,627	1,100	1,033	1,019	1,038	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2016	2,752	1,370	1,037	1,033	1,019	1,028	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2017	2,579	1,108	1,037	1,033	1,019	1,028	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2018	1,530	1,108	1,037	1,033	1,019	1,028	1,003	1,015	1,036	0,997	1,010	1,023	0,998	1,003	1,019	1,000	1,012	1,005	1,005	1,000	1,000	1,000	1,000	1,000	1,000	1,000
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	187,103	327,100	338,664	372,338	396,280	430,925	430,925	512,003	544,249	569,328	646,825	671,833	646,361	606,161	639,180	653,025	882,676	881,282	881,282	881,282	881,282	875,960	875,960	875,960	875,960	875,960
1995	229,050	359,228	339,169	335,712	470,908	649,998	734,664	739,266	741,392	863,373	854,043	822,060	822,060	849,516	809,668	809,668	809,668	829,668	829,668	830,629	830,629	830,629	830,629	830,629	830,629	830,629
1996	2,074,608	2,312,993	2,456,425	2,673,073	3,413,485	3,354,566	3,767,622	3,665,813	3,718,947	3,524,021	3,596,366	3,799,750	3,534,045	3,643,349	3,685,176	3,687,940	3,723,882	3,707,363	3,757,936	3,887,596	3,887,596	3,887,596	3,883,098	3,883,098	3,883,098	3,883,098
1997	2,442,529	3,316,045	3,412,288	3,824,641	4,550,958	4,242,391	4,279,592	4,307,216	4,098,636	4,132,668	3,921,636	3,948,530	4,066,588	4,211,839	4,260,918	4,384,037	4,407,729	4,572,643	4,676,769	4,693,260	4,611,814	4,642,882	4,642,882	4,642,882	4,642,882	4,642,882
1998	3,675,965	3,559,113	4,365,735	4,088,438	4,086,851	4,304,774	4,307,747	4,235,040	4,274,042	4,324,783	4,519,773	4,581,805	4,653,835	4,710,482	4,749,789	4,737,115	4,702,682	5,014,309	5,265,050	5,323,794	5,363,065	5,363,065	5,363,065	5,363,065	5,363,065	5,363,065
1999	4,067,062	5,601,871	6,575,350	6,817,456	7,271,227	7,701,357	7,847,662	8,301,935	8,284,562	9,236,158	9,590,694	9,635,104	10,051,467	10,019,020	10,022,011	10,110,720	10,135,116	9,873,136	9,588,326	9,576,992	9,576,992	9,576,992	9,576,992	9,576,992	9,576,992	9,576,992
2000	2,762,343	3,611,594	3,705,600	5,011,259	5,112,429	4,908,784	4,977,899	4,921,943	4,894,275	4,961,257	5,054,309	5,076,112	5,193,017	5,303,446	5,303,354	5,511,724	5,574,262	5,673,733	5,687,601	5,715,439	5,715,439	5,715,439	5,715,439	5,715,439	5,715,439	5,715,439
2001	2,251,558	1,743,446	1,822,201	1,993,523	1,894,340	1,918,963	2,011,132	1,987,488	2,052,066	2,067,276	2,144,617	2,157,214	2,187,052	2,164,958	2,164,958	2,231,893	2,231,893	2,255,449	2,265,967	2,277,058	2,277,058	2,277,058	2,277,058	2,277,058	2,277,058	2,277,058
2002	2,542,017	2,760,461	3,397,838	3,606,278	3,602,481	3,629,619	4,269,535	4,184,966	4,189,633	4,220,328	4,314,840	4,395,247	4,388,354	4,323,344	4,389,340	4,444,852	4,388,828	4,443,598	4,464,320	4,486,171	4,486,171	4,486,171	4,486,171	4,486,171	4,486,171	4,486,171
2003	2,947,566	2,552,226	2,729,345	2,821,402	3,038,665	2,996,630	2,935,032	2,905,668	2,883,632	3,043,090	3,031,155	3,041,419	3,049,245	3,081,544	3,188,294	3,379,908	3,379,468	3,421,642	3,437,598	3,454,424	3,454,424	3,454,424	3,454,424	3,454,424	3,454,424	3,454,424
2004	2,784,076	2,021,522	2,025,940	1,938,584	2,234,614	2,224,835	2,035,591	2,059,705	2,105,618	2,182,953	2,200,006	2,244,931	2,310,706	2,310,705	2,304,758	2,348,037	2,347,731	2,377,030	2,388,115	2,399,803	2,399,803	2,399,803	2,399,803	2,399,803	2,399,803	2,399,803
2005	2,418,554	2,416,450	2,572,849	2,483,026	2,274,631	2,281,970	2,229,537	2,333,344	2,437,114	2,347,584	2,309,022	2,411,172	2,717,437	2,667,437	2,676,022	2,726,273	2,725,918	2,759,936	2,772,807	2,786,378	2,786,378	2,786,378	2,786,378	2,786,378	2,786,378	2,786,378
2006	2,279,915	1,590,227	1,471,489	1,494,938	1,675,834	1,640,664	1,549,814	1,484,507	1,497,613	1,440,812	1,418,755	1,418,755	1,568,383	1,564,946	1,569,983	1,599,464	1,599,256	1,619,214	1,626,765	1,634,727	1,634,727	1,634,727	1,634,727	1,634,727	1,634,727	1,634,727
2007	3,103,989	3,505,775	3,323,381	3,112,793	3,0																					

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Selection of Loss Development Factors

RY	Development Period in Months																		228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228						
1994												Excluded												
1995	1.568	0.944	0.990	1.403	1.380	1.130	1.006	1.003	1.165	0.989	0.963	1.000	1.033	0.953	1.000	1.000	1.025	1.000	1.000	1.001	1.000	1.000	1.000	
1996	1.115	1.062	1.088	1.277	0.983	1.123	0.973	1.014	0.948	1.021	1.057	0.930	1.031	1.011	1.001	1.010	0.996	1.014	1.035	1.000	0.999			
1997	1.358	1.029	1.121	1.190	0.932	1.009	1.006	0.952	1.008	0.949	1.007	1.030	1.036	1.012	1.029	1.005	1.037	1.023	1.004	0.983	1.007			
1998	0.968	1.227	0.936	1.000	1.053	1.001	0.983	1.009	1.012	1.045	1.014	1.016	1.012	1.008	0.997	0.993	1.066	1.050	1.011	1.007				
1999	1.377	1.174	1.037	1.067	1.059	1.019	1.058	0.998	1.115	1.038	1.005	1.043	0.997	1.000	1.009	1.002	0.974	0.971	0.999					
2000	1.307	1.026	1.352	1.020	0.960	1.014	0.989	0.994	1.014	1.019	1.004	1.023	1.021	1.000	1.039	1.011	1.018	1.002						
2001	0.774	1.045	1.094	0.950	1.013	1.048	0.988	1.032	1.007	1.037	1.006	1.014	0.990	1.000	1.031	1.000	1.011							
2002	1.086	1.231	1.061	0.999	1.008	1.176	0.980	1.001	1.007	1.022	1.019	0.998	0.985	1.015	1.013	0.987								
2003	0.866	1.069	1.034	1.077	0.986	0.979	0.990	0.992	1.055	0.996	1.003	1.003	1.011	1.035	1.060									
2004	0.726	1.002	0.957	1.153	0.996	0.915	1.012	1.022	1.037	1.008	1.020	1.029	1.000	0.997										
2005	0.999	1.065	0.965	0.916	1.003	0.977	1.047	1.044	0.963	0.984	1.044	1.127	0.982											
2006	0.697	0.925	1.016	1.121	0.979	0.945	0.958	1.009	0.962	0.985	1.000	1.105												
2007	1.129	0.948	0.943	0.962	1.063	1.019	1.010	1.028	1.090	1.012	1.005													
2008	0.720	0.880	1.052	1.089	1.010	1.024	0.994	1.105	1.066	1.000														
2009	0.825	0.842	0.957	1.023	0.974	1.022	0.998	1.008	1.073															
2010	0.696	0.928	0.970	1.076	1.062	1.073	1.007	0.983																
2011	0.832	1.000	1.031	0.966	1.093	1.020	1.004																	
2012	0.858	0.963	1.329	1.028	0.996	1.035																		
2013	0.764	1.126	1.009	0.996	1.083																			
2014	0.746	1.081	0.949	1.207																				
2015	2.616	1.627	1.100																					
2016	2.752	1.370																						
2017	2.579																							
VOL WTD 3	2.641	1.291	1.011	1.069	1.051	1.042	1.003	1.040	1.078	1.003	1.016	1.086	0.998	1.017	1.032	1.001	0.992	0.999	1.003	0.997	1.003	0.999	1.000	NA
VOL WTD 5	1.153	1.173	1.075	1.056	1.039	1.034	1.003	1.052	1.040	1.000	1.014	1.039	0.993	1.024	1.000	1.012	1.012	1.005	1.008	0.997	1.003	0.999	1.000	NA
VOL WTD ALL	1.004	1.071	1.051	1.059	1.015	1.028	1.004	1.008	1.036	1.013	1.013	1.023	1.007	1.006	1.019	1.002	1.011	1.005	1.008	0.997	1.003	0.999	1.000	NA
ARITH 3	2.649	1.359	1.019	1.077	1.057	1.043	1.003	1.032	1.077	0.999	1.016	1.087	0.997	1.016	1.035	1.000	1.001	1.008	1.005	0.997	1.002	0.999	1.000	NA
ARITH 5	1.892	1.233	1.084	1.055	1.041	1.035	1.003	1.027	1.031	0.998	1.015	1.053	0.993	1.009	1.030	0.999	1.021	1.012	1.010	0.998	1.002	0.999	1.000	NA
ARITH ALL	1.190	1.071	1.047	1.076	1.033	1.029	1.000	1.012	1.035	1.007	1.011	1.027	1.009	1.003	1.020	1.001	1.018	1.010	1.010	0.998	1.002	0.999	1.000	NA
5 YR HI LO	1.987	1.193	1.047	1.033	1.047	1.027	1.003	1.015	1.034	0.997	1.010	1.046	0.992	1.005	1.028	0.998	1.022	1.013	1.005	1.001	1.000	NA	NA	NA
7 YR HI LO	1.530	1.108	1.013	1.043	1.024	1.003	1.022	1.039	1.000	1.011	1.035	0.996	1.005	1.024	1.002	1.017	1.010	1.005	1.001	1.000	NA	NA	NA	NA
ALL YR HI LO	1.139	1.055	1.037	1.067	1.019	1.027	0.999	1.010	1.032	1.009	1.012	1.026	1.009	1.006	1.017	1.002	1.017	1.010	1.005	1.001	1.000	NA	NA	NA
SELECTED	1.530	1.108	1.037	1.033	1.019	1.028	1.003	1.015	1.036	0.997	1.010	1.023	0.998	1.003	1.019	1.000	1.012	1.005	1.005	1.000	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Incurred Losses

	Development in Months																											
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288				
1994	187,103	327,100	338,664	372,338	396,280	430,925	430,925	512,003	544,249	569,328	646,825	671,833	646,361	606,161	639,180	653,025	882,676	881,282	881,282	881,282	881,282	875,960	875,960	875,960				
1995	229,050	359,228	339,169	335,712	470,908	649,998	734,664	739,266	741,392	863,373	854,043	822,060	822,060	849,516	809,668	809,668	809,668	829,668	829,668	829,668	830,629	830,629	830,629	830,629				
1996	2,074,608	2,312,993	2,456,425	2,673,073	3,413,485	3,354,566	3,767,622	3,665,813	3,718,947	3,524,021	3,596,366	3,799,750	3,534,045	3,643,349	3,685,176	3,687,940	3,723,882	3,707,363	3,757,936	3,887,596	3,887,596	3,887,596	3,887,596	3,887,596				
1997	2,442,529	3,316,045	3,412,288	3,824,641	4,550,958	4,242,391	4,279,592	4,307,216	4,096,636	4,132,668	3,921,636	3,946,530	4,066,588	4,211,839	4,260,918	4,384,037	4,407,729	4,572,643	4,676,769	4,693,260	4,611,814	4,642,882						
1998	3,675,965	3,559,113	4,365,735	4,088,438	4,086,851	4,304,774	4,307,747	4,235,040	4,274,042	4,324,783	4,519,773	4,581,805	4,653,835	4,710,482	4,749,789	4,737,115	4,702,682	5,014,309	5,265,050	5,323,794	5,363,065							
1999	4,067,062	5,601,871	6,575,350	6,817,456	7,271,227	7,701,357	7,847,662	8,301,935	8,284,562	9,236,158	9,590,694	9,635,104	10,051,467	10,019,020	10,022,011	10,110,720	10,135,116	9,873,136	9,588,326	9,576,992								
2000	2,762,343	3,611,594	3,705,600	5,011,259	5,112,429	4,908,784	4,977,899	4,921,943	4,894,275	4,961,257	5,054,309	5,076,112	5,193,017	5,303,446	5,303,354	5,511,724	5,574,262	5,673,733	5,687,601									
2001	2,251,558	1,743,446	1,822,201	1,993,523	1,894,340	1,918,963	2,011,132	1,987,488	2,052,066	2,067,276	2,144,617	2,157,214	2,187,052	2,164,958	2,164,958	2,231,893	2,231,893	2,255,449										
2002	2,542,017	2,760,461	3,397,838	3,606,278	3,602,481	3,629,619	4,269,535	4,184,966	4,189,633	4,220,328	4,314,840	4,395,247	4,388,354	4,323,344	4,389,340	4,444,852	4,388,828											
2003	2,947,566	2,552,226	2,729,345	2,821,402	3,038,665	2,996,630	2,935,032	2,905,668	2,883,632	3,043,090	3,031,155	3,041,419	3,049,245	3,081,544	3,188,294	3,379,908												
2004	2,784,076	2,021,522	2,025,940	1,938,584	2,234,614	2,224,835	2,035,591	2,059,705	2,105,618	2,182,953	2,200,006	2,244,931	2,310,706	2,310,705	2,304,758													
2005	2,418,554	2,416,450	2,572,849	2,483,026	2,274,631	2,281,970	2,229,537	2,333,344	2,437,114	2,347,584	2,309,022	2,411,172	2,717,437	2,667,437														
2006	2,279,915	1,590,227	1,471,489	1,494,938	1,675,834	1,640,664	1,549,814	1,484,507	1,497,613	1,440,812	1,418,755	1,418,755	1,568,383															
2007	3,103,989	3,505,775	3,323,381	3,132,793	3,014,940	3,205,988	3,265,791	3,297,252	3,387,988	3,692,463	3,736,180	3,753,895																
2008	3,378,033	2,432,035	2,139,716	2,250,962	2,450,839	2,475,575	2,534,647	2,518,897	2,784,301	2,969,033	2,968,102																	
2009	2,770,198	2,286,030	1,923,883	1,840,582	1,883,630	1,833,921	1,873,872	1,869,496	1,884,955	2,023,386																		
2010	2,399,535	1,670,654	1,551,137	1,504,347	1,618,767	1,718,575	1,843,937	1,857,606	1,825,960																			
2011	1,730,234	1,440,222	1,440,536	1,484,741	1,433,817	1,567,380	1,598,788	1,605,837																				
2012	2,490,976	2,137,662	2,058,476	2,735,440	2,811,353	2,799,426	2,897,254																					
2013	3,392,371	2,592,125	2,918,959	2,945,843	2,934,795	3,178,441																						
2014	3,096,607	2,310,421	2,498,436	2,371,070	2,861,330																							
2015	421,275	1,102,257	1,793,275	1,972,587																								
2016	524,435	1,443,017	1,977,045																									
2017	786,586	2,028,988																										
2018	1,101,470																											

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM ULTIMATE</u>	<u>INC LDM ULTIMATE</u>	<u>SELECTED ULTIMATE</u>	<u>POLICIES IN FORCE</u>	<u>PURE PREMIUM</u>
2008	3,068,621	3,195,561	3,132,091	2,664	1,176
2009	2,385,549	2,172,775	2,279,162	2,662	856
2010	1,950,285	2,032,235	1,991,260	2,622	759
2011	2,059,681	1,813,826	1,936,753	2,623	738
2012	2,966,883	3,282,856	3,124,869	2,617	1,194
2013	3,947,335	3,702,844	3,825,089	2,603	1,469
2014	3,016,161	3,396,279	3,206,220	2,573	1,246
2015	3,040,122	2,419,470	2,729,796	2,530	1,079
2016	2,304,864	2,514,485	2,409,675	2,509	960
2017	2,543,316	2,859,618	2,701,467	2,489	1,085
2018	2,245,872	2,375,350	2,310,611	2,487	929
TOTAL	29,528,689	29,765,298	29,646,994	28,379	1,045

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	1,176	1,299	980	2,611,069	20.4%	533,358	2,441,800	2,975,158	2,968,102	7,057	526,301	1,117
2009	2,662	856	936	990	2,635,200	23.8%	626,934	1,818,009	2,444,943	2,023,386	421,557	205,377	918
2010	2,622	759	822	1,000	2,621,558	27.4%	717,236	1,416,703	2,133,940	1,825,960	307,980	409,256	814
2011	2,623	738	792	1,010	2,648,784	30.1%	797,224	1,439,764	2,236,988	1,605,837	631,151	166,073	853
2012	2,617	1,194	1,268	1,020	2,669,152	32.3%	863,072	2,007,539	2,870,611	2,897,254	(26,643)	889,715	1,097
2013	2,603	1,469	1,544	1,030	2,681,422	36.3%	973,313	2,514,517	3,487,829	3,178,441	309,388	663,925	1,340
2014	2,573	1,246	1,297	1,040	2,677,023	41.2%	1,101,815	1,774,763	2,876,578	2,861,330	15,248	1,086,567	1,118
2015	2,530	1,079	1,112	1,051	2,658,608	49.7%	1,322,373	1,527,986	2,850,359	1,972,587	877,773	444,600	1,127
2016	2,509	960	980	1,061	2,662,905	57.3%	1,525,758	984,252	2,510,010	1,977,045	532,965	992,792	1,000
2017	2,489	1,085	1,096	1,072	2,668,095	69.8%	1,861,812	768,576	2,630,388	2,028,988	601,399	1,260,412	1,057
2018	2,487	929	929	1,083	2,692,611	90.6%	2,438,625	211,847	2,650,471	1,101,470	1,549,001	889,623	1,066
TOTAL	28,379				29,226,427		12,761,519	16,905,757	29,667,275	24,440,399	5,226,877	7,534,642	1,045
	<u>Pure Premium Selection</u>				Trend =	1.010							
	3-Year Average x Latest		1,002										
	5-Year Average x Latest		1,083										
	All Year Average x Latest		1,098										
	Selected Pure Premium		1,083										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Closure
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	1,176	1,299	980	2,611,069	7.1%	185,855	2,968,102	3,153,957	2,441,800	712,156	526,301	1,184
2009	2,662	856	936	990	2,635,200	6.9%	181,183	2,023,386	2,204,569	1,818,009	386,560	205,377	828
2010	2,622	759	822	1,000	2,621,558	10.2%	266,093	1,825,960	2,092,052	1,416,703	675,349	409,256	798
2011	2,623	738	792	1,010	2,648,784	11.5%	303,732	1,605,837	1,909,569	1,439,764	469,805	166,073	728
2012	2,617	1,194	1,268	1,020	2,669,152	11.7%	313,517	2,897,254	3,210,771	2,007,539	1,203,232	889,715	1,227
2013	2,603	1,469	1,544	1,030	2,681,422	14.2%	379,747	3,178,441	3,558,188	2,514,517	1,043,672	663,925	1,367
2014	2,573	1,246	1,297	1,040	2,677,023	15.8%	421,658	2,861,330	3,282,989	1,774,763	1,508,226	1,086,567	1,276
2015	2,530	1,079	1,112	1,051	2,658,608	18.5%	491,053	1,972,587	2,463,640	1,527,986	935,653	444,600	974
2016	2,509	960	980	1,061	2,662,905	21.4%	569,164	1,977,045	2,546,208	984,252	1,561,956	992,792	1,015
2017	2,489	1,085	1,096	1,072	2,668,095	29.0%	774,998	2,028,988	2,803,987	768,576	2,035,411	1,260,412	1,127
2018	2,487	929	929	1,083	2,692,611	53.6%	1,444,024	1,101,470	2,545,494	211,847	2,333,648	889,623	1,024
TOTAL	28,379				29,226,427		5,331,025	24,440,399	29,771,424	16,905,757	12,865,667	7,534,642	1,049
	<u>Pure Premium Selection</u>				Trend =	1.010							
	3-Year Average x Latest		1,002										
	5-Year Average x Latest		1,083										
	All Year Average x Latest		1,098										
	Selected Pure Premium		1,083										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
BY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	3,040,481	2,862,976	3,022,670	159,693	17,811	177,505
1995	3,041,597	2,864,027	2,917,052	53,025	124,545	177,570
1996	2,344,436	2,154,274	2,344,436	190,161	-	190,161
1997	3,877,360	3,626,458	3,703,945	77,487	173,415	250,902
1998	2,971,774	2,510,541	2,971,774	461,233	-	461,233
1999	2,879,192	2,650,903	2,750,103	99,201	129,089	228,290
2000	3,976,297	3,605,836	3,805,884	200,048	170,413	370,461
2001	1,107,092	928,198	1,107,092	178,894	-	178,894
2002	4,548,061	3,881,563	4,459,410	577,848	88,650	666,498
2003	3,372,756	2,817,658	3,223,096	405,438	149,661	555,098
2004	5,079,848	4,112,757	4,327,913	215,156	751,935	967,090
2005	2,219,551	1,731,576	1,963,983	232,407	255,568	487,975
2006	3,687,158	2,764,255	3,014,915	250,659	672,244	922,903
2007	1,114,898	785,680	857,453	81,773	247,445	329,218
2008	2,590,150	1,717,896	2,051,978	334,082	538,172	872,254
2009	1,517,751	917,398	935,849	18,451	581,903	600,354
2010	379,769	214,795	224,795	10,000	154,975	164,975
2011	1,497,560	724,726	1,497,560	772,834	-	772,834
2012	1,299,056	609,736	880,779	271,044	418,277	689,320
2013	1,963,414	799,890	989,033	189,143	974,381	1,163,524
2014	516,203	174,091	320,154	146,063	196,049	342,112
2015	3,797,701	1,282,058	1,769,881	487,823	2,027,820	2,515,643
2016	1,840,713	369,308	818,967	440,659	1,021,746	1,471,405
2017	1,569,257	199,097	771,193	572,095	798,064	1,370,159
2018	921,715	24,083	198,003	173,920	723,712	897,632
TOTAL	61,153,791	44,329,778	50,937,916	6,608,138	10,215,875	16,824,013

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Development of Losses to Ultimate

Development Period in Months																										
RY	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT	
1994																									1,062	
1995	3,760	1,734	1,593	1,161	1,131	1,269	1,382	1,086	1,093	1,276	1,062	1,051	1,033	1,037	1,032	1,021	1,022	1,024	1,014	1,015	1,001	1,012	1,007	1,000	1,062	
1996		2,391	4,177	1,897	1,678	1,269	1,332	1,060	1,130	1,071	1,029	1,053	1,054	1,140	1,002	1,054	1,034	1,094	1,043	1,081	1,007	1,000	1,000	1,000	1,062	
1997	520,511	1,681	1,601	1,318	1,251	1,227	1,559	1,139	1,061	1,178	1,027	1,023	1,046	1,081	1,029	1,026	1,015	1,005	1,008	1,010	1,009	1,007	1,000	1,000	1,062	
1998	18,330	1,363	1,853	1,780	1,198	1,171	1,075	1,059	1,104	1,156	1,118	1,118	1,199	1,046	1,167	1,015	1,092	1,081	1,015	1,038	1,006	1,007	1,000	1,000	1,062	
1999	3,453	1,116	1,035	1,044	1,071	1,044	1,043	1,153	1,042	1,074	1,049	1,032	1,027	1,020	1,019	1,012	1,004	1,002	1,006	1,010	1,006	1,007	1,000	1,000	1,062	
2000	8,917	1,206	1,216	1,172	1,090	1,079	1,091	1,076	1,157	1,053	1,017	1,032	1,036	1,009	1,034	1,025	1,024	1,028	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2001	1,729	1,108	1,687	1,112	1,158	1,220	1,100	1,171	1,005	1,045	1,023	1,028	1,025	1,010	1,033	1,097	1,051	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2002	3,256	2,453	2,032	1,367	1,642	1,240	1,180	1,126	1,054	1,044	1,077	1,079	1,065	1,072	1,035	1,077	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2003	3,629	2,485	1,410	1,189	1,228	1,199	1,072	1,100	1,068	1,027	1,049	1,080	1,108	1,059	1,037	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2004	6,103	1,809	1,261	1,316	1,260	1,135	1,132	1,107	1,123	1,052	1,041	1,049	1,023	1,044	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2005	5,222	2,259	1,250	1,104	1,109	1,018	1,046	1,053	1,054	1,103	1,033	1,092	1,032	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2006	100,428	1,629	1,471	1,443	1,147	1,195	1,128	1,059	1,101	1,326	1,291	1,157	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2007	45,101	1,733	1,075	1,017	1,041	1,044	1,029	1,102	1,029	1,011	1,015	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2008		1,535	1,328	1,727	1,493	1,274	1,276	1,178	1,118	1,138	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2009	2,291	1,458	1,263	1,107	1,204	1,079	1,036	1,033	1,004	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2010		2,208	2,273	1,135	1,042	1,130	1,052	1,017	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2011	2,002	2,024	1,869	1,704	1,133	1,260	1,127	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2012	6,056	1,931	1,627	1,289	1,221	1,139	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2013		2,029	1,850	2,184	1,178	1,152	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2014		3,013	1,147	1,138	1,208	1,152	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2015	5,351	1,634	1,133	1,138	1,133	1,079	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2016	4,953	1,891	1,330	1,264	1,208	1,152	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2017		1,581	1,330	1,264	1,208	1,152	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
2018	4,856	1,581	1,330	1,264	1,208	1,152	1,120	1,076	1,069	1,097	1,063	1,064	1,041	1,038	1,032	1,022	1,029	1,032	1,015	1,010	1,006	1,007	1,000	1,000	1,062	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	-	67,556	105,762	224,445	322,720	593,891	727,102	973,960	1,223,383	1,680,534	1,736,151	1,783,144	1,901,121	1,985,974	2,229,646	2,353,177	2,416,592	2,500,825	2,575,464	2,617,719	2,729,017	2,757,576	2,813,689	2,862,976	3,040,481	
1995	57,146	214,861	372,610	593,564	689,047	779,151	988,375	1,365,685	1,483,319	1,621,206	2,068,109	2,195,718	2,307,489	2,384,650	2,474,037	2,554,120	2,607,829	2,663,932	2,728,277	2,767,464	2,808,933	2,811,884	2,845,490	2,864,027	2,864,027	3,041,597
1996	-	17,700	42,316	176,760	335,328	562,825	713,987	950,907	1,008,006	1,138,950	1,219,963	1,255,045	1,321,564	1,392,644	1,587,262	1,590,384	1,676,801	1,734,357	1,897,262	1,979,584	2,139,915	2,154,274	2,154,274	2,154,274	2,287,839	
1997	439	228,598	384,266	615,310	810,739	1,014,623	1,245,366	1,941,775	2,211,344	2,345,205	2,763,348	2,836,923	2,901,679	3,033,730	3,280,943	3,376,266	3,462,906	3,516,084	3,532,892	3,559,664	3,594,408	3,626,458	3,650,998	3,650,998	3,877,360	
1998	6,465	118,511	161,556	299,311	532,819	638,505	747,760	804,023	851,858	940,596	1,087,299	1,215,530	1,359,258	1,629,754	1,704,629	1,889,855	2,018,841	2,204,678	2,382,158	2,418,884	2,510,541	2,525,046	2,542,134	2,542,134	2,699,746	
1999	357,471	1,234,237	1,376,895	1,425,317	1,488,590	1,594,064	1,663,943	1,736,098	2,001,842	2,085,194	2,238,708	2,349,101	2,424,075	2,490,558	2,539,119	2,586,804	2,618,422	2,627,746	2,634,286	2,650,903	2,677,412	2,692,881	2,711,104	2,711,104	2,711,104	2,879,192
2000	114,187	1,018,212	1,227,935	1,493,269	1,750,358	1,908,405	2,059,006	2,247,037	2,418,072	2,797,305	2,945,570	2,995,139	3,091,814	3,203,887	3,233,491	3,344,627	3,426,721	3,508,911	3,605,836	3,661,019	3,697,629	3,718,993	3,744,159	3,744,159	3,744,159	3,976,297
2001	104,196	180,134	199,654	336,731	374,550	433,710	529,272	581,958	681,517	684,727	715,780	732,297	752,978	771,454	779,324	805,227	883,218	928,198	958,176	972,840	982,568	988,245	994,932	994,932	994,932	1,056,618
2002	39,750	129,433	317,549	645,166	881,959	1,448,299	1,795,420	2,119,144	2,385,722	2,515,613	2,626,157	2,827,608	3,051,616	3,249,469	3,483,473	3,604,479	3,881,563	3,995,296	4,124,329	4,187,447	4,229,322	4,253,757	4,282,543	4,282,543	4,282,543	4,548,061
2003	70,930	257,387	639,714	902,054	1,072,965	1,317,164	1,579,451	1,692,868	1,861,811	1,989,247	2,043,300	2,143,512	2,315,479	2,565,592	2,717,089	2,817,658	2,878,494	2,962,836	3,058,525	3,105,332	3,136,386	3,154,507	3,175,854	3,175,854	3,175,854	3,372,756
2004	90,918	554,838	1,003,934	1,265,633	1,665,587	2,099,306	2,382,002	2,697,142	2,987,009	3,355,323	3,528,803	3,673,274	3,851,449	3,939,069	4,112,757	4,243,791	4,335,419	4,462,450	4,606,571	4,677,069	4,723,840	4,751,133	4,783,284	4,783,284	4,783,284	5,079,848
2005	64,509	336,850	760,805	951,148	1,049,818	1,164,238	1,184,748	1,238,896	1,279,491	1,348,838	1,487,208	1,535,671	1,677,117	1,731,576	1,796,998	1,854,251	1,894,286	1,949,790	2,012,761	2,043,564	2,064,000	2,075,925	2,089,973	2,089,973	2,089,973	2,219,551
2006																										

Missouri Petroleum Storage Tank Insurance Fund
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Selection of Loss Development Factors

RY	Development Period in Months																							
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300
1994												Excluded												
1995	3.760	1.734	1.593	1.161	1.131	1.269	1.382	1.086	1.093	1.276	1.062	1.051	1.033	1.037	1.032	1.021	1.022	1.024	1.014	1.015	1.001	1.012	1.007	1.007
1996		2.391	4.177	1.897	1.678	1.269	1.332	1.060	1.130	1.071	1.029	1.053	1.054	1.140	1.002	1.054	1.034	1.094	1.043	1.081	1.007	1.000		
1997	520.511	1.681	1.601	1.318	1.251	1.227	1.559	1.139	1.061	1.178	1.027	1.023	1.046	1.081	1.029	1.026	1.015	1.005	1.008	1.010	1.009			
1998	18.330	1.363	1.853	1.780	1.198	1.171	1.075	1.059	1.104	1.156	1.118	1.118	1.199	1.046	1.167	1.015	1.092	1.081	1.015	1.038				
1999	3.453	1.116	1.035	1.044	1.071	1.044	1.043	1.153	1.042	1.074	1.049	1.032	1.027	1.020	1.019	1.012	1.004	1.002	1.006					
2000	8.917	1.206	1.216	1.172	1.090	1.079	1.091	1.076	1.157	1.053	1.017	1.032	1.036	1.009	1.034	1.025	1.024	1.028						
2001	1.729	1.108	1.687	1.112	1.158	1.220	1.100	1.171	1.005	1.045	1.023	1.028	1.025	1.010	1.033	1.097	1.051							
2002	3.256	2.453	2.032	1.367	1.642	1.240	1.180	1.126	1.054	1.044	1.077	1.079	1.065	1.072	1.035	1.077								
2003	3.629	2.485	1.410	1.189	1.228	1.199	1.072	1.100	1.068	1.027	1.049	1.080	1.108	1.059	1.037									
2004	6.103	1.809	1.261	1.316	1.260	1.135	1.132	1.107	1.123	1.052	1.041	1.049	1.023	1.044										
2005	5.222	2.259	1.250	1.104	1.109	1.018	1.046	1.033	1.054	1.103	1.033	1.092	1.032											
2006	100.428	1.629	1.471	1.443	1.147	1.195	1.128	1.059	1.101	1.326	1.291	1.157												
2007	45.101	1.733	1.075	1.017	1.041	1.044	1.029	1.102	1.029	1.011	1.015													
2008		1.535	1.328	1.727	1.493	1.274	1.276	1.178	1.118	1.138														
2009	2.291	1.458	1.263	1.107	1.204	1.079	1.036	1.033	1.004															
2010		2.208	2.273	1.135	1.042	1.130	1.052	1.017																
2011	2.002	2.024	1.869	1.704	1.133	1.260	1.127																	
2012	6.056	1.931	1.627	1.289	1.221	1.139																		
2013		2.029	1.850	2.184	1.178																			
2014			3.013	1.147	1.138																			
2015	5.351	1.634	1.133																					
2016	4.953	1.891																						
2017																								
VOL WTD 3	6.437	1.753	1.218	1.606	1.177	1.188	1.072	1.106	1.061	1.183	1.145	1.091	1.050	1.057	1.035	1.056	1.020	1.034	1.009	1.036	1.006	1.007	1.007	NA
VOL WTD 5	7.189	1.791	1.318	1.569	1.175	1.179	1.120	1.091	1.069	1.117	1.087	1.087	1.052	1.043	1.032	1.040	1.030	1.034	1.015	1.031	1.006	1.007	1.007	NA
VOL WTD ALL	4.856	1.581	1.330	1.264	1.208	1.152	1.157	1.101	1.084	1.105	1.063	1.064	1.053	1.051	1.040	1.036	1.029	1.032	1.015	1.031	1.006	1.007	1.007	NA
ARITH 3	5.152	2.179	1.377	1.537	1.177	1.176	1.072	1.076	1.050	1.158	1.113	1.099	1.054	1.058	1.035	1.066	1.026	1.037	1.010	1.043	1.006	1.006	1.007	NA
ARITH 5	5.152	2.100	1.525	1.490	1.156	1.176	1.104	1.078	1.061	1.126	1.086	1.091	1.051	1.039	1.032	1.045	1.037	1.042	1.017	1.036	1.006	1.006	1.007	NA
ARITH ALL	43.594	1.850	1.626	1.360	1.225	1.166	1.156	1.094	1.076	1.111	1.064	1.066	1.059	1.052	1.043	1.041	1.035	1.039	1.017	1.036	1.006	1.006	1.007	NA
5 YR HI LO	NA	1.951	1.541	1.377	1.172	1.176	1.072	1.065	1.061	1.097	1.041	1.084	1.041	1.038	1.034	1.039	1.030	1.038	1.012	1.026	1.007	NA	NA	NA
7 YR HI LO	5.152	2.017	1.551	1.399	1.156	1.161	1.078	1.067	1.074	1.073	1.044	1.066	1.037	1.036	1.034	1.039	1.029	1.034	1.012	1.026	1.007	NA	NA	NA
ALL YR HI LO	14.590	1.829	1.523	1.333	1.209	1.169	1.138	1.093	1.076	1.101	1.048	1.061	1.047	1.046	1.031	1.036	1.029	1.034	1.012	1.026	1.007	NA	NA	NA
SELECTED	4.856	1.581	1.330	1.264	1.208	1.152	1.120	1.076	1.069	1.097	1.063	1.064	1.041	1.038	1.032	1.022	1.029	1.032	1.015	1.010	1.006	1.007	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
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Paid Losses

	Development in Months																			
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	-	67,556	105,762	224,445	322,720	593,891	727,102	973,960	1,223,383	1,680,534	1,736,151	1,783,144	1,901,121	1,985,974	2,108,783	2,229,646	2,353,177	2,416,592	2,500,825	2,575,464
1995	57,146	214,861	372,610	593,564	689,047	779,151	988,375	1,365,685	1,483,319	1,621,206	2,068,109	2,195,718	2,307,489	2,384,650	2,474,037	2,554,120	2,607,829	2,663,932	2,728,277	2,767,464
1996	-	17,700	42,316	176,760	335,328	562,825	713,987	950,907	1,008,006	1,138,950	1,219,963	1,255,045	1,321,564	1,392,644	1,587,262	1,590,384	1,676,801	1,734,357	1,897,262	1,979,584
1997	439	228,598	384,266	615,310	810,739	1,014,623	1,245,366	1,941,775	2,211,344	2,345,205	2,763,348	2,836,923	2,901,679	3,033,730	3,280,943	3,376,266	3,462,906	3,516,084	3,532,892	3,559,664
1998	6,465	118,511	161,556	299,311	532,819	638,505	747,760	804,023	851,858	940,596	1,087,299	1,215,530	1,359,258	1,629,754	1,704,629	1,989,855	2,018,841	2,204,678	2,382,158	2,418,884
1999	357,471	1,234,137	1,376,895	1,425,317	1,488,590	1,594,064	1,663,943	1,736,098	2,001,842	2,085,194	2,238,708	2,349,101	2,424,075	2,490,058	2,539,119	2,586,804	2,618,422	2,627,746	2,634,286	2,650,903
2000	114,187	1,018,212	1,227,935	1,493,269	1,750,358	1,906,405	2,059,006	2,247,037	2,418,072	2,797,305	2,945,750	2,995,139	3,091,814	3,203,887	3,233,491	3,344,627	3,426,721	3,508,911	3,605,836	
2001	104,196	180,134	199,654	336,731	374,550	433,710	529,272	581,958	681,517	684,727	715,780	732,297	752,978	771,454	779,324	805,227	883,218	928,198		
2002	39,750	129,433	317,549	645,166	881,959	1,448,299	1,795,420	2,119,144	2,385,722	2,515,613	2,626,157	2,827,608	3,051,616	3,249,469	3,483,473	3,604,479	3,881,563			
2003	70,930	257,387	639,714	902,054	1,072,965	1,317,164	1,579,451	1,692,868	1,861,811	1,989,247	2,043,300	2,143,512	2,315,479	2,565,592	2,717,089	2,817,658				
2004	90,918	554,838	1,003,934	1,265,633	1,665,587	2,099,306	2,382,002	2,697,142	2,987,009	3,355,323	3,528,803	3,673,274	3,851,449	3,939,069	4,112,757					
2005	64,509	336,850	760,805	951,148	1,049,818	1,164,238	1,184,748	1,238,896	1,279,491	1,348,838	1,487,208	1,535,671	1,677,117	1,731,576						
2006	2,233	224,299	365,337	537,313	775,151	888,935	1,062,080	1,197,945	1,268,221	1,395,888	1,851,282	2,389,601	2,764,255							
2007	7,065	318,642	552,262	593,816	603,938	628,469	656,318	675,212	744,229	765,632	774,413	785,680								
2008	-	134,080	205,854	273,370	472,091	704,738	898,168	1,146,107	1,350,478	1,510,195	1,717,896									
2009	140,848	322,681	470,506	594,291	657,716	792,191	854,383	884,880	913,849	917,398										
2010	-	29,916	66,069	150,177	170,474	177,574	200,650	211,147	214,795											
2011	34,886	69,855	141,373	264,278	450,244	510,173	642,965	724,726												
2012	17,882	108,288	209,139	340,184	438,523	535,264	609,736													
2013	-	82,788	168,015	310,824	678,846	799,890														
2014	-	44,273	133,385	153,017	174,091															
2015	129,482	692,863	1,132,035	1,282,058																
2016	39,426	195,261	369,308																	
2017	-	199,097																		
2018	24,083																			

Missouri Petroleum Storage Tank Insurance Fund
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Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	3,037,783	2,862,976	3,022,670	159,693	15,113	174,807
1995	2,945,818	2,864,027	2,917,052	53,025	28,766	81,791
1996	2,380,279	2,154,274	2,344,436	190,161	35,843	226,005
1997	3,783,030	3,626,458	3,703,945	77,487	79,085	156,573
1998	3,055,366	2,510,541	2,971,774	461,233	83,592	544,825
1999	2,848,305	2,650,903	2,750,103	99,201	98,202	197,402
2000	3,974,075	3,605,836	3,805,884	200,048	168,191	368,239
2001	1,164,580	928,198	1,107,092	178,894	57,488	236,381
2002	4,798,581	3,881,563	4,459,410	577,848	339,170	917,018
2003	3,576,030	2,817,658	3,223,096	405,438	352,934	758,372
2004	4,880,095	4,112,757	4,327,913	215,156	552,182	767,338
2005	2,312,716	1,731,576	1,963,983	232,407	348,734	581,140
2006	3,623,565	2,764,255	3,014,915	250,659	608,651	859,310
2007	1,062,164	785,680	867,453	81,773	194,711	276,484
2008	2,589,298	1,717,896	2,051,978	334,082	537,321	871,403
2009	1,227,996	917,398	935,849	18,451	292,147	310,598
2010	313,423	214,795	224,795	10,000	88,628	98,628
2011	2,180,272	724,726	1,497,560	772,834	682,712	1,455,546
2012	1,363,947	609,736	880,779	271,044	483,168	754,211
2013	1,643,996	799,890	989,033	189,143	654,963	844,106
2014	584,328	174,091	320,154	146,063	264,174	410,237
2015	3,674,600	1,282,058	1,769,881	487,823	1,904,719	2,392,542
2016	1,936,816	369,308	818,967	449,659	1,117,849	1,567,508
2017	1,921,916	199,097	771,193	572,095	1,150,723	1,722,818
2018	755,270	24,083	198,003	173,920	557,267	731,187
TOTAL	61,634,249	44,329,778	50,937,916	6,608,138	10,696,334	17,304,471

Missouri Petroleum Storage Tank Insurance Fund
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Development of Losses to Ultimate

RY	Development Period in Months																			300 - ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300		
1994																									1.005	
1995	1.245	0.927	1.155	0.988	1.043	1.069	1.204	0.975	1.001	1.145	0.992	1.010	1.043	0.997	1.033	1.005	1.012	0.983	1.008	1.000	1.002	1.012	1.000	1.005	1.005	1.005
1996	0.783	1.411	1.368	1.380	1.056	1.117	1.105	1.027	1.010	0.884	0.936	1.043	1.017	1.103	1.016	1.097	0.999	1.028	1.181	1.000	1.000	1.000	1.000	1.005	1.005	1.005
1997	1.860	1.230	1.198	1.413	1.137	1.171	1.111	1.037	1.003	1.089	1.016	0.971	1.084	1.034	1.005	1.005	1.002	1.014	1.002	1.001	0.997	1.006	1.005	1.005	1.005	1.005
1998	1.032	0.989	1.073	1.294	1.108	1.049	1.241	1.024	1.091	0.997	1.032	0.982	1.077	1.312	1.061	1.018	1.079	1.017	1.023	1.000	1.007	1.006	1.005	1.005	1.005	1.005
1999	1.034	1.090	1.052	1.039	1.011	0.999	1.185	1.022	1.029	1.061	1.028	0.999	0.956	1.005	0.996	0.999	0.997	1.000	1.000	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2000	1.255	1.096	1.119	1.055	1.021	1.029	1.063	1.049	1.044	1.051	1.024	1.025	1.000	0.998	1.028	1.002	0.979	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005	1.005
2001	0.974	1.074	1.046	1.005	1.062	1.075	0.986	1.015	0.991	1.000	1.020	1.034	1.000	1.109	1.000	1.000	1.035	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2002	1.015	1.073	0.969	1.211	1.074	1.037	1.026	1.103	1.039	1.026	1.089	1.034	1.013	1.024	1.015	1.041	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2003	0.931	1.129	1.067	0.881	1.164	1.048	1.003	1.017	0.993	1.093	1.063	1.007	0.996	1.012	1.024	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2004	0.775	1.030	1.089	1.071	1.138	1.004	1.096	1.069	1.092	1.005	1.022	0.997	1.008	1.025	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2005	1.822	1.024	1.042	0.960	0.988	1.032	1.023	1.000	1.013	1.029	1.038	1.054	1.034	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2006	1.152	1.011	1.056	1.179	0.992	1.005	1.068	1.082	1.148	1.060	1.015	1.002	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2007	0.859	0.861	0.898	1.026	1.003	1.019	1.041	1.139	1.000	1.000	1.000	1.010	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005
2008	1.310	1.076	1.062	1.284	1.133	1.178	1.124	1.113	1.056	1.015	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2009	0.838	0.960	1.065	1.041	1.068	1.009	0.984	0.981	1.000	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2010	1.292	1.275	1.339	1.000	1.000	1.038	1.037	0.947	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2011	1.186	0.941	2.132	1.086	1.074	1.630	0.747	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2012	1.319	1.158	1.159	1.093	1.463	0.990	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2013	1.390	0.989	1.040	1.623	0.957	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2014	1.602	0.891	1.000	1.121	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2015	1.851	1.135	0.993	1.138	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2016	0.838	1.184	1.139	1.138	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2017	2.792	1.054	1.139	1.138	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005
2018	1.531	1.054	1.139	1.138	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005	1.005	1.005

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	65,047	1,005,018	1,023,016	1,087,349	1,499,341	2,078,139	2,573,685	2,525,449	2,944,082	3,003,278	2,995,177	2,924,889	2,550,436	2,574,369	2,688,316	2,614,164	2,736,632	2,714,782	2,772,423	2,896,698	2,962,023	3,116,839	3,142,787	3,022,670	3,022,670	3,037,783
1995	1,345,826	1,675,949	1,553,606	1,794,446	1,772,905	1,849,070	1,976,684	2,379,084	2,318,512	2,321,479	2,657,629	2,635,614	2,661,105	2,775,105	2,766,065	2,856,864	2,870,975	2,906,668	2,855,886	2,879,342	2,878,011	2,883,696	2,917,052	2,917,052	2,931,162	2,945,818
1996	634,958	497,443	701,793	959,776	1,324,610	1,399,259	1,562,675	1,726,825	1,773,459	1,791,890	1,583,674	1,482,276	1,546,632	1,573,321	1,734,904	1,761,831	1,933,421	1,932,111	1,985,403	2,344,436	2,344,436	2,344,436	2,344,436	2,357,036	2,368,437	2,380,279
1997	502,583	935,032	1,150,245	1,378,150	1,947,336	2,214,227	2,591,866	2,880,119	2,986,984	2,997,120	3,265,114	3,318,830	3,221,107	3,492,440	3,610,025	3,626,882	3,643,635	3,651,096	3,700,587	3,708,217	3,713,372	3,703,945	3,726,064	3,746,089	3,764,209	3,783,030
1998	752,604	776,480	767,994	823,905	1,066,204	1,181,568	1,239,878	1,538,625	1,576,160	1,719,015	1,713,432	1,768,332	1,735,967	1,869,464	2,452,683	2,602,586	2,649,256	2,857,819	2,905,273	2,970,679	2,971,774	2,991,492	3,009,357	3,025,530	3,040,165	3,055,366
1999	1,712,508	1,770,639	1,930,013	2,030,050	2,108,235	2,131,472	2,129,530	2,523,204	2,577,625	2,653,444	2,814,130	2,892,443	2,889,189	2,760,814	2,773,420	2,761,910	2,758,547	2,750,103	2,750,103	2,750,103	2,770,378	2,788,760	2,805,413	2,820,491	2,834,134	2,848,305
2000	1,698,608	2,131,795	2,337,379	2,616,121	2,758,703	2,816,918	2,899,853	3,083,798	3,236,082	3,377,793	3,550,236	3,636,238	3,725,562	3,779,290	3,772,662	3,878,829	3,886,359	3,805,884	3,837,060	3,865,348	3,890,996	3,914,231	3,935,268	3,954,303	3,974,075	
2001	903,017	879,435	768,432	803,398	807,374	857,373	921,857	909,006	922,903	914,707	914,707	932,652	964,133	964,133	1,069,609	1,069,609	1,069,609	1,107,092	1,115,292	1,124,428	1,132,718	1,140,234	1,147,043	1,153,208	1,158,786	1,164,580
2002	2,102,792	2,135,359	2,291,076	2,220,507	2,690,036	2,888,001	2,995,721	3,073,653	3,390,124	3,520,988	3,614,155	3,934,639	4,066,718	4,119,846	4,218,927	4,281,991	4,459,410	4,561,706	4,595,495	4,633,139	4,667,297	4,698,265	4,726,321	4,751,723	4,774,707	4,798,581
2003	2,188,347	2,037,947	2,300,433	2,453,916	2,162,594	2,638,216	2,645,657	2,689,486	2,669,997	2,918,788	3,102,947	3,124,594	3,111,514	3,149,028	3,223,096	3,323,271	3,399,505	3,424,685	3,452,738	3,478,193	3,501,272	3,522,180	3,541,110	3,558,239	3,576,030	
2004	3,003,287	2,327,925	2,398,477	2,611,344	2,796,197	3,183,380	3,197,130	3,503,732	3,744,551	4,090,314	4,110,662	4,200,197	4,188,550	4,221,388	4,327,913	4,398,458	4,535,164	4,639,197	4,673,560	4,711,844	4,746,581	4,778,076	4,806,609	4,832,442	4,855,816	4,880,095
2005	855,094	1,558,332	1,595,861	1,662,314	1,596,329	1,577,303	1,627,822	1,664,850	1,665,200	1,687,550	1,736,223	1,801,967	1,899,621	1,963,983	2,051,033	2,084,464	2,149,250	2,198,553	2,214,838	2,232,981	2,249,443	2,264,368	2,277,890	2,290,133	2,301,210	2,312,716
2006	1,458,736	1,680,496	1,698,579	1,793,328	2,114,309	2,096,877	2,106,813	2,250,803	2,435,160	2,795,151	2,963,704	3,008,941	3,014,915	3,077,169	3,213,559	3,265,940	3,367,447	3,444,694	3,498,635	3,524,428	3,547,813	3,569,000	3,588,181	3,605,538	3,623,565	
2007	1,049,030	901,475	776,584	697,298	715																					

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Selection of Loss Development Factors

RY	Development Period in Months																															
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300								
1994												Excluded																				
1995	1.245	0.927	1.155	0.988	1.043	1.069	1.204	0.975	1.001	1.145	0.992	1.010	1.043	0.997	1.033	1.005	1.012	0.983	1.008	1.000	1.002	1.012	1.000									
1996	0.783	1.411	1.368	1.380	1.056	1.117	1.105	1.027	1.010	0.884	0.936	1.043	1.017	1.103	1.016	1.097	0.999	1.028	1.181	1.000	1.000	1.000										
1997	1.860	1.230	1.198	1.413	1.137	1.171	1.111	1.037	1.003	1.089	1.016	0.971	1.084	1.034	1.005	1.005	1.002	1.014	1.002	1.001	0.997											
1998	1.032	0.989	1.073	1.294	1.108	1.049	1.241	1.024	1.091	0.997	1.032	0.982	1.077	1.312	1.061	1.018	1.079	1.017	1.023	1.000												
1999	1.034	1.090	1.052	1.039	1.011	0.999	1.185	1.022	1.029	1.061	1.028	0.999	0.956	1.005	0.996	0.999	0.997	1.000	1.000													
2000	1.255	1.096	1.119	1.055	1.021	1.029	1.063	1.049	1.044	1.051	1.024	1.025	1.000	1.014	0.998	1.028	1.002	0.979														
2001	0.974	0.874	1.046	1.005	1.062	1.075	0.986	1.015	0.991	1.000	1.020	1.034	1.000	1.109	1.000	1.000	1.035															
2002	1.015	1.073	0.969	1.211	1.074	1.037	1.026	1.103	1.039	1.026	1.089	1.034	1.013	1.024	1.015	1.041																
2003	0.931	1.129	1.067	0.881	1.164	1.048	1.003	1.017	0.993	1.093	1.063	1.007	0.996	1.012	1.024																	
2004	0.775	1.030	1.089	1.071	1.138	1.004	1.096	1.069	1.092	1.005	1.022	0.997	1.008	1.025																		
2005	1.822	1.024	1.042	0.960	0.988	1.032	1.023	1.000	1.013	1.029	1.038	1.054	1.034																			
2006	1.152	1.011	1.056	1.179	0.992	1.005	1.068	1.082	1.148	1.060	1.015	1.002																				
2007	0.859	0.861	0.898	1.026	1.003	1.019	1.041	1.139	1.000	1.000	1.000																					
2008	1.310	1.076	1.062	1.284	1.133	1.178	1.124	1.113	1.056	1.015																						
2009	0.838	0.960	1.065	1.041	1.068	1.009	0.984	0.981	1.000																							
2010	1.292	1.275	1.339	1.000	1.000	1.038	1.037	0.947																								
2011	1.186	0.941	2.132	1.086	1.074	1.630	0.747																									
2012	1.319	1.158	1.159	1.093	1.463	0.990																										
2013	1.390	0.989	1.040	1.623	0.957																											
2014	1.602	0.891	1.000	1.121																												
2015	1.851	1.135	0.993																													
2016	0.838	1.184																														
2017	2.792																															
VOL WTD 3	1.555	1.118	1.005	1.327	1.116	1.331	0.839	1.057	1.029	1.035	1.020	1.010	1.009	1.021	1.016	1.031	1.005	0.997	1.008	1.001	1.000	1.006	1.000	NA								
VOL WTD 5	1.531	1.100	1.178	1.208	1.098	1.220	0.946	1.077	1.063	1.023	1.031	1.015	1.010	1.025	1.008	1.023	1.018	1.005	1.032	1.000	1.000	1.006	1.000	NA								
VOL WTD ALL	1.117	1.054	1.093	1.109	1.073	1.073	1.064	1.044	1.040	1.040	1.027	1.010	1.018	1.044	1.016	1.023	1.015	1.001	1.032	1.000	1.000	1.006	1.000	NA								
ARITH 3	1.827	1.070	1.011	1.279	1.165	1.219	0.923	1.014	1.019	1.025	1.018	1.018	1.013	1.020	1.013	1.023	1.011	0.999	1.008	1.001	1.000	1.006	1.000	NA								
ARITH 5	1.694	1.071	1.265	1.185	1.112	1.169	0.987	1.053	1.043	1.022	1.028	1.019	1.010	1.037	1.007	1.017	1.023	1.007	1.043	1.000	1.000	1.006	1.000	NA								
ARITH ALL	1.268	1.062	1.139	1.138	1.079	1.083	1.061	1.038	1.034	1.032	1.021	1.013	1.021	1.063	1.016	1.024	1.018	1.003	1.043	1.000	1.000	1.006	1.000	NA								
5 YR HI LO	1.614	1.094	1.066	1.100	1.047	1.075	1.021	1.059	1.023	1.016	1.025	1.014	1.007	1.021	1.004	1.015	1.013	1.010	1.011	1.000	1.000	NA	NA	NA								
7 YR HI LO	1.470	1.081	1.121	1.125	1.055	1.050	1.031	1.049	1.032	1.027	1.032	1.020	1.003	1.037	1.008	1.018	1.010	1.003	1.011	1.000	1.000	NA	NA	NA								
ALL YR HI LO	1.219	1.054	1.100	1.125	1.063	1.055	1.070	1.037	1.029	1.036	1.023	1.013	1.021	1.041	1.013	1.016	1.010	1.003	1.011	1.000	1.000	NA	NA	NA								
SELECTED	1.531	1.054	1.139	1.138	1.098	1.073	1.064	1.044	1.063	1.040	1.031	1.019	1.021	1.044	1.016	1.031	1.023	1.007	1.008	1.007	1.007	1.006	1.005	1.005								

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Incurred Losses

RY	Development in Months																			
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	65,047	1,005,018	1,028,016	1,087,349	1,499,341	2,078,139	2,573,685	2,525,449	2,944,082	3,003,278	2,995,177	2,924,889	2,550,436	2,574,369	2,688,316	2,614,164	2,736,632	2,714,782	2,772,423	2,896,698
1995	1,345,826	1,675,949	1,553,606	1,794,446	1,772,905	1,849,070	1,976,684	2,379,084	2,318,512	2,321,479	2,657,629	2,635,614	2,661,105	2,775,105	2,766,065	2,856,864	2,870,975	2,906,668	2,855,886	2,879,342
1996	634,958	497,443	701,793	959,776	1,324,610	1,399,259	1,562,675	1,726,825	1,773,459	1,791,890	1,583,674	1,482,276	1,546,632	1,573,321	1,734,904	1,761,831	1,933,421	1,932,111	1,985,403	2,344,436
1997	502,583	935,032	1,150,245	1,378,150	1,947,336	2,214,227	2,591,866	2,880,119	2,986,984	2,997,120	3,265,114	3,318,830	3,221,107	3,492,440	3,610,025	3,626,882	3,643,635	3,651,096	3,700,587	3,708,217
1998	752,604	776,480	767,994	823,905	1,066,204	1,181,568	1,239,878	1,538,625	1,576,160	1,719,015	1,713,432	1,768,332	1,735,967	1,869,464	2,452,683	2,602,586	2,649,256	2,857,819	2,905,273	2,970,679
1999	1,712,508	1,770,639	1,930,013	2,030,050	2,108,225	2,131,472	2,129,530	2,523,004	2,577,625	2,653,444	2,814,130	2,892,443	2,889,189	2,760,814	2,773,420	2,761,910	2,758,547	2,750,103	2,750,103	2,750,103
2000	1,698,608	2,131,795	2,337,379	2,616,121	2,758,703	2,816,918	2,899,853	3,083,798	3,236,082	3,377,793	3,550,236	3,636,238	3,726,564	3,725,592	3,779,290	3,772,662	3,878,829	3,886,359	3,805,884	
2001	903,017	879,435	768,432	803,398	807,374	857,373	921,857	909,006	922,903	914,707	914,707	932,652	964,133	964,133	1,069,609	1,069,609	1,069,609	1,107,092		
2002	2,102,792	2,135,359	2,291,076	2,220,507	2,690,036	2,888,001	2,995,721	3,073,653	3,390,124	3,520,988	3,614,155	3,934,639	4,066,718	4,119,846	4,218,927	4,281,991	4,459,410			
2003	2,188,347	2,037,947	2,300,433	2,453,916	2,162,594	2,516,185	2,638,216	2,645,657	2,689,486	2,669,997	2,918,788	3,102,947	3,124,594	3,111,514	3,149,028	3,223,096				
2004	3,003,287	2,327,925	2,398,477	2,611,344	2,796,197	3,183,380	3,197,130	3,503,732	3,744,551	4,090,314	4,110,662	4,200,197	4,188,550	4,221,388	4,327,913					
2005	855,094	1,558,332	1,595,861	1,662,314	1,596,329	1,577,303	1,627,822	1,664,850	1,665,200	1,687,550	1,736,223	1,801,967	1,899,621	1,963,983						
2006	1,458,736	1,680,496	1,698,579	1,793,328	2,114,309	2,096,877	2,106,813	2,250,803	2,435,160	2,795,151	2,963,704	3,008,941	3,014,915							
2007	1,049,030	901,475	776,584	697,298	715,705	717,904	731,520	761,453	867,453	867,453	867,453	867,453								
2008	596,136	781,142	840,868	893,113	1,147,030	1,299,395	1,530,368	1,720,312	1,915,158	2,021,967	2,051,978									
2009	1,008,223	844,876	811,301	864,241	899,372	960,149	968,896	953,538	935,849	935,849										
2010	100,002	129,253	164,798	220,645	220,645	220,645	228,932	237,342	224,795											
2011	443,503	526,138	494,996	1,055,259	1,146,204	1,230,702	2,005,572	1,497,560												
2012	314,431	414,642	480,020	556,332	607,983	889,634														
2013	445,007	618,612	611,639	636,393	1,032,995	989,033														
2014	200,006	320,413	285,522	285,522	320,154															
2015	848,506	1,570,384	1,782,239	1,769,881																
2016	825,402	691,547	818,967																	
2017	276,254	771,193																		
2018	198,003																			

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PURE</u> <u>PREMIUM</u>
2008	2,590,150	2,589,298	2,589,724	2,664	972
2009	1,517,751	1,227,996	1,372,873	2,662	516
2010	379,769	313,423	346,596	2,622	132
2011	1,497,560	2,180,272	2,180,272	2,623	831
2012	1,299,056	1,363,947	1,363,947	2,617	521
2013	1,963,414	1,643,996	1,643,996	2,603	632
2014	516,203	584,328	584,328	2,573	227
2015	3,797,701	3,674,600	3,674,600	2,530	1,452
2016	1,840,713	1,936,816	1,936,816	2,509	772
2017	1,569,257	1,921,916	1,921,916	2,489	772
2018	921,715	755,270	755,270	2,487	304
TOTAL	17,893,289	18,191,862	18,370,339	28,379	647

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<u>RY</u>	<u>POLICIES IN FORCE</u>	<u>PROJECTED PURE PREM</u>	<u>TRENDED PURE PREM</u>	<u>DETRENDED PURE PREM</u>	<u>EXPECTED LOSSES</u>	<u>PERCENT UNPAID</u>	<u>EXPECTED UNPAID</u>	<u>PAID LOSSES</u>	<u>INDICATED ULTIMATE</u>	<u>INCURRED LOSSES</u>	<u>IBNR RESERVE</u>	<u>CASE RESERVE</u>	<u>ULTIMATE PURE PREM</u>
2008	2,664	972	1,074	718	1,911,928	33.7%	643,857	1,717,896	2,361,753	2,051,978	309,776	334,082	887
2009	2,662	516	564	725	1,929,598	39.6%	763,261	917,398	1,680,659	935,849	744,810	18,451	631
2010	2,622	132	143	732	1,919,609	43.4%	833,893	214,795	1,048,687	224,795	823,893	10,000	400
2011	2,623	831	891	739	1,939,544	47.4%	920,140	724,726	1,644,865	1,497,560	147,306	772,834	627
2012	2,617	521	553	747	1,954,459	53.1%	1,037,098	609,736	1,646,834	880,779	766,054	271,044	629
2013	2,603	632	664	754	1,963,443	59.3%	1,163,542	799,890	1,963,432	989,033	974,398	189,143	754
2014	2,573	227	236	762	1,960,222	66.3%	1,299,133	174,091	1,473,223	320,154	1,153,069	146,063	573
2015	2,530	1,452	1,496	769	1,946,738	73.3%	1,427,460	1,282,058	2,709,518	1,769,881	939,637	487,823	1,071
2016	2,509	772	787	777	1,949,885	79.9%	1,558,674	369,308	1,927,981	818,967	1,109,015	449,659	768
2017	2,489	772	780	785	1,953,685	87.3%	1,705,814	199,097	1,904,911	771,193	1,133,719	572,095	765
2018	2,487	304	304	793	1,971,636	97.4%	1,920,121	24,083	1,944,204	198,003	1,746,201	173,920	782
TOTAL	28,379				21,400,748		13,272,992	7,033,075	20,306,068	10,458,190	9,847,877	3,425,115	716

Pure Premium Selection

Trend = 1.010

3-Year Average x Latest	1,021
5-Year Average x Latest	793
All Year Average x Latest	719
Selected Pure Premium	793

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance UST - Other
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<u>RY</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PROJECTED</u> <u>PURE PREM</u>	<u>TRENDED</u> <u>PURE PREM</u>	<u>DETRENDED</u> <u>PURE PREM</u>	<u>EXPECTED</u> <u>LOSSES</u>	<u>PERCENT</u> <u>IBNR</u>	<u>EXPECTED</u> <u>IBNR</u>	<u>INCURRED</u> <u>LOSSES</u>	<u>INDICATED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSSES</u>	<u>UNPAID</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>ULTIMATE</u> <u>PURE PREM</u>
2008	2,664	972	1,074	718	1,911,928	20.8%	396,756	2,051,978	2,448,733	1,717,896	730,838	334,082	919
2009	2,662	516	564	725	1,929,598	23.8%	459,062	935,849	1,394,911	917,398	477,513	18,451	524
2010	2,622	132	143	732	1,919,609	28.3%	542,818	224,795	767,613	214,795	552,818	10,000	293
2011	2,623	831	891	739	1,939,544	31.3%	607,333	1,497,560	2,104,893	724,726	1,380,167	772,834	802
2012	2,617	521	553	747	1,954,459	35.4%	692,352	880,779	1,573,131	609,736	963,396	271,044	601
2013	2,603	632	664	754	1,963,443	39.8%	782,229	989,033	1,771,263	799,890	971,373	189,143	680
2014	2,573	227	236	762	1,960,222	45.2%	886,215	320,154	1,206,369	174,091	1,032,278	146,063	469
2015	2,530	1,452	1,496	769	1,946,738	51.8%	1,009,086	1,769,881	2,778,967	1,282,058	1,496,910	487,823	1,098
2016	2,509	772	787	777	1,949,885	57.7%	1,125,392	818,967	1,944,359	369,308	1,575,051	449,659	775
2017	2,489	772	780	785	1,953,685	59.9%	1,169,745	771,193	1,940,937	199,097	1,741,840	572,095	780
2018	2,487	304	304	793	1,971,636	73.8%	1,454,748	198,003	1,652,751	24,083	1,628,669	173,920	665
TOTAL	28,379				21,400,748		9,125,737	10,458,190	19,583,927	7,033,075	12,550,852	3,425,115	690

<u>Pure Premium Selection</u>		Trend =	1.010
3-Year Average x Latest	1,021		
5-Year Average x Latest	793		
All Year Average x Latest	719		
Selected Pure Premium	793		

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
BY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	114,027	114,027	114,027	-	-	-
1996	67,357,776	60,816,782	67,147,099	6,330,317	210,677	6,540,993
1997	8,956,641	8,056,789	8,662,253	605,464	294,388	899,852
1998	18,971,581	16,792,391	18,971,581	2,179,191	-	2,179,191
1999	8,377,010	7,276,048	8,039,539	763,491	337,471	1,100,963
2000	14,987,967	12,583,946	14,987,967	2,404,021	-	2,404,021
2001	3,425,000	2,135,112	3,425,000	1,289,889	-	1,289,889
2002	3,382,181	2,737,830	3,340,765	602,935	41,416	644,351
2003	1,174,225	925,066	1,107,025	181,959	67,200	249,159
2004	2,037,947	1,508,295	2,037,947	529,652	-	529,652
2005	3,164,235	2,334,050	2,776,623	444,573	385,612	830,185
2006	533,938	300,938	533,938	233,000	-	233,000
2007	1,560,892	1,076,420	1,302,593	226,173	258,299	484,473
2008	966,979	615,335	634,174	18,839	332,805	351,644
2009	1,064,734	659,857	774,343	114,485	290,392	404,877
2010	886,809	485,492	886,809	401,317	-	401,317
2011	1,773,194	904,905	1,773,194	868,290	-	868,290
2012	522,057	271,398	360,480	89,082	161,578	250,659
2013	1,311,204	636,244	1,061,991	425,747	249,213	674,960
2014	1,193,782	548,829	731,229	182,400	462,554	644,953
2015	225,947	91,292	222,633	131,341	3,314	134,655
2016	985,060	350,684	868,811	518,127	116,249	634,376
2017	1,262,204	295,863	662,913	367,050	599,291	966,340
2018	1,347,600	73,595	582,223	508,627	765,378	1,274,005
TOTAL	145,582,991	121,591,186	141,007,156	19,415,970	4,575,835	23,991,805

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Development of Losses to Ultimate

RY	Development Period in Months																				RY	ULT				
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	300-ULT	
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,073
1995	-	-	-	-	-	-	-	9,287	1,127	1,000	1,241	1,000	1,041	1,014	1,069	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,010	1,073
1996	20,724	3,266	2,407	2,036	1,409	1,264	1,161	1,143	1,103	1,082	1,072	1,051	1,076	1,061	1,043	1,032	1,031	1,021	1,035	1,021	1,023	1,021	1,023	1,021	1,010	1,084
1997	16,836	2,049	1,602	1,266	1,153	1,071	1,019	1,041	1,041	1,021	1,095	1,027	1,040	1,046	1,018	1,013	1,006	1,012	1,012	1,008	1,029	1,014	1,012	1,010	1,073	
1998	12,647	2,010	1,342	1,146	1,074	1,053	1,029	1,071	1,035	1,080	1,051	1,056	1,031	1,025	1,017	1,018	1,019	1,010	1,012	1,018	1,016	1,014	1,012	1,010	1,073	
1999	4,821	1,254	1,276	1,187	1,132	1,024	1,044	1,039	1,066	1,103	1,056	1,032	1,019	1,020	1,016	1,012	1,013	1,023	1,018	1,019	1,016	1,014	1,012	1,010	1,073	
2000	2,319	1,409	1,202	1,169	1,115	1,077	1,140	1,034	1,054	1,044	1,028	1,027	1,031	1,030	1,030	1,027	1,025	1,030	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2001	3,234	1,268	1,346	1,170	1,170	1,155	1,112	1,155	1,112	1,047	1,052	1,037	1,018	1,009	1,041	1,065	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073		
2002	10,139	2,111	1,125	1,147	1,072	1,092	1,039	1,043	1,094	1,033	1,046	1,078	1,043	1,070	1,090	1,065	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2003	2,817	1,576	1,195	1,149	1,129	1,151	1,063	1,049	1,089	1,032	1,076	1,029	1,063	1,058	1,049	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2004	4,773	1,326	1,368	1,217	1,136	1,111	1,059	1,037	1,046	1,032	1,043	1,015	1,037	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2005	1,426	1,466	1,590	1,161	1,212	1,132	1,037	1,039	1,095	1,041	1,261	1,036	1,008	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2006	4,537	3,865	1,419	1,348	1,051	1,042	1,000	1,000	1,000	1,000	1,000	1,000	1,056	1,056	1,056	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,073	
2007	41,628	3,049	1,218	1,215	1,257	1,101	1,081	1,141	1,098	1,002	1,068	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2008	4,194	1,048	1,204	1,247	1,256	1,030	1,086	1,045	1,015	1,032	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2009	3,022	1,570	1,139	1,055	1,015	1,097	1,034	1,018	1,058	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2010	1,835	1,081	1,363	1,047	1,069	1,179	1,088	1,071	1,027	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2011	2,766	1,844	1,117	1,100	1,076	1,061	1,034	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2012	13,380	1,407	1,134	1,101	1,063	1,086	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2013	5,111	1,534	1,499	1,181	1,057	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2014	13,888	1,678	1,154	1,132	1,055	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2015	2,243	1,078	1,138	1,138	1,055	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2016	1,274	1,135	1,138	1,138	1,055	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2017	2,086	1,519	1,135	1,138	1,055	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
2018	4,292	1,519	1,135	1,138	1,055	1,071	1,064	1,046	1,071	1,027	1,084	1,032	1,036	1,036	1,031	1,028	1,025	1,020	1,027	1,019	1,016	1,014	1,012	1,010	1,073	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	7,781	72,262	81,424	81,424	101,034	101,034	105,196	106,705	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	115,160	123,595
1996	40,315	835,499	2,728,718	6,568,905	13,373,754	18,845,638	23,820,837	27,664,147	31,626,348	34,871,004	37,747,448	40,455,899	42,554,558	45,765,782	48,568,937	50,658,185	52,285,341	53,882,728	55,011,326	56,923,526	58,124,590	59,473,654	60,816,782	61,527,979	62,139,032	67,557,776
1997	61,400	1,033,729	2,118,455	3,394,699	4,296,273	4,951,705	5,303,380	5,403,843	5,623,039	5,851,196	5,972,517	6,542,594	6,722,493	6,993,563	7,314,218	7,443,710	7,541,990	7,586,859	7,674,403	7,767,216	7,828,234	8,056,789	8,167,746	8,263,261	8,345,325	8,956,641
1998	239,795	3,032,700	6,094,264	8,178,370	9,375,140	10,068,463	10,602,282	10,912,410	11,684,792	12,096,844	13,060,306	13,727,870	14,499,065	14,951,449	15,319,415	15,575,277	15,862,219	16,158,393	16,312,830	16,500,587	16,792,391	17,064,794	17,299,809	17,502,115	17,675,933	18,970,738
1999	436,835	2,105,831	2,641,761	3,370,046	3,998,601	4,527,780	4,638,276	4,843,173	5,084,595	5,366,728	5,917,688	6,249,511	6,450,553	6,745,295	6,809,966	6,899,663	6,982,923	7,144,639	7,263,048	7,415,105	7,535,392	7,639,169	7,739,619	7,805,256	8,377,010	
2000	1,404,622	3,256,938	4,590,454	5,519,248	6,451,995	7,193,747	7,750,786	8,836,291	9,135,094	9,627,642	10,050,268	10,330,492	10,607,398	10,934,896	11,265,746	11,608,205	11,922,692	12,218,748	12,583,946	12,923,017	13,169,998	13,383,640	13,567,958	13,726,623	13,862,947	14,878,441
2001	-	147,472	476,981	604,628	813,801	911,192	1,074,243	1,252,777	1,447,406	1,609,378	1,685,756	1,773,480	1,839,082	1,870,679	1,904,981	1,922,955	2,005,524	2,135,112	2,176,952	2,235,609	2,278,335	2,315,294	2,347,180	2,374,628	2,398,212	2,573,886
2002	47,379	480,361	1,014,084	1,140,741	1,308,579	1,402,608	1,531,018	1,591,392	1,659,124	1,814,667	1,875,002	1,960,925	2,114,181	2,204,070	2,358,085	2,569,598	2,737,830	2,805,615	2,860,594	2,937,672	2,993,816	3,042,381	3,084,281	3,120,348	3,151,338	3,382,181
2003	71,422	201,172	317,027	378,728	435,080	491,064	565,402	600,804	630,373	686,253	708,407	762,255	784,155	833,873	881,870	925,066	950,519	973,053	993,140	1,019,900	1,039,392	1,056,253	1,070,800	1,083,322	1,094,081	1,174,225
2004	84,160	401,722	532,740	728,973	887,261	1,008,297	1,120,106	1,186,075	1,229,393	1,286,274	1,327,154	1,384,142	1,404,444	1,456,535	1,508,295	1,555,251	1,598,044	1,637,609	1,669,700	1,714,690	1,747,461	1,775,808	1,800,264	1,821,316	1,839,404	1,974,145
2005	115,085	394,303	570,217	906,812	1,053,062	1,275,950	1,444,651	1,497,871	1,556,506	1,704,631	1,773,966	2,236,223	2,315,908	2,334,050	2,417,552	2,492,816	2,561,406	2,624,823	2,676,259	2,748,370	2,800,896	2,846,332	2,885,531	2,919,275	2,948,267	3,164,235
2006	8,574	37,183	143,721	203,989	274,938	288,877	300,938	300,938	300,938	300,938	300,938	300,938	300,938	311,805	322,960	333,014	342,177	350,649	357,520	367,154	374,170	380,240	385,477	389,985	393,858	422,709
2007	2,861	119,076	363,029	442,068	537,077	674,872	743,159	803,483	916,913	1,006,421	1,008,109	1,076,420	1,111,242	1,151,368	1,192,559	1,229,686	1,263,521	1,294,904	1,320,177	1,355,749	1,381,660	1,404,073	1,423,410	1,440,055	1,454,357	1,560,892
2008	60,614	254,231	266,381	320,759	400,143	502,530	517,750	562,296	587,385	596,073	615,335	666,846	688,419	713,277	738,795	761,795	782,756	802,136	817,855	839,892	855,944	869,829	881,808	892,120	90	

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Selection of Loss Development Factors

RY	Development Period in Months																															
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300								
1994												Excluded																				
1995								9.287	1.127	1.000	1.241	1.000	1.041	1.014	1.069	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
1996	20.724	3.266	2.407	2.036	1.409	1.264	1.161	1.143	1.103	1.082	1.072	1.051	1.076	1.061	1.043	1.032	1.031	1.021	1.035	1.021	1.023	1.023	1.023	1.023								
1997	16.836	2.049	1.602	1.266	1.153	1.071	1.019	1.041	1.041	1.021	1.095	1.027	1.040	1.046	1.018	1.013	1.006	1.012	1.012	1.008	1.029											
1998	12.647	2.010	1.342	1.146	1.074	1.053	1.029	1.071	1.035	1.080	1.051	1.056	1.031	1.025	1.017	1.018	1.019	1.010	1.012	1.018												
1999	4.821	1.254	1.276	1.187	1.132	1.024	1.044	1.039	1.066	1.103	1.056	1.032	1.019	1.020	1.016	1.012	1.013	1.023	1.018													
2000	2.319	1.409	1.202	1.169	1.115	1.077	1.140	1.034	1.054	1.044	1.028	1.027	1.031	1.030	1.030	1.027	1.025	1.030														
2001		3.234	1.268	1.346	1.120	1.179	1.166	1.155	1.112	1.047	1.052	1.037	1.017	1.018	1.009	1.043	1.065															
2002	10.139	2.111	1.125	1.147	1.072	1.092	1.039	1.043	1.094	1.033	1.046	1.078	1.043	1.070	1.090	1.065																
2003	2.817	1.576	1.195	1.149	1.129	1.151	1.063	1.049	1.089	1.032	1.076	1.029	1.063	1.058	1.049																	
2004	4.773	1.326	1.368	1.217	1.136	1.111	1.059	1.037	1.046	1.032	1.043	1.015	1.037	1.036																		
2005	3.426	1.446	1.590	1.161	1.212	1.132	1.037	1.039	1.095	1.041	1.261	1.036	1.008																			
2006	4.337	3.865	1.419	1.348	1.051	1.042	1.000	1.000	1.000	1.000	1.000	1.000																				
2007	41.628	3.049	1.218	1.215	1.257	1.101	1.081	1.141	1.098	1.002	1.068																					
2008	4.194	1.048	1.204	1.247	1.256	1.030	1.086	1.045	1.015	1.032																						
2009	3.022	1.570	1.139	1.055	1.015	1.097	1.034	1.018	1.058																							
2010		1.835	1.081	1.363	1.047	1.069	1.179	1.088																								
2011	2.766	1.844	1.117	1.100	1.081	1.076	1.034																									
2012	13.380	1.407	1.134	1.101	1.063	1.086																										
2013	5.111	1.534	1.499	1.181	1.057																											
2014	13.888	1.678	1.154	1.132																												
2015		2.243	1.078																													
2016		1.274																														
2017	2.086																															
VOL WTD 3	4.292	1.519	1.285	1.147	1.069	1.076	1.064	1.046	1.063	1.011	1.172	1.025	1.027	1.056	1.053	1.035	1.025	1.019	1.013	1.019	1.024	1.023	1.000	NA								
VOL WTD 5	5.318	1.506	1.205	1.157	1.054	1.071	1.072	1.069	1.071	1.027	1.125	1.041	1.029	1.036	1.031	1.024	1.019	1.020	1.027	1.019	1.024	1.023	1.000	NA								
VOL WTD ALL	4.557	1.757	1.427	1.343	1.199	1.137	1.101	1.092	1.075	1.068	1.066	1.045	1.052	1.046	1.034	1.028	1.025	1.020	1.027	1.019	1.024	1.023	1.000	NA								
ARITH 3	2.086	1.732	1.243	1.138	1.067	1.077	1.082	1.050	1.057	1.011	1.109	1.017	1.036	1.054	1.049	1.045	1.034	1.021	1.014	1.016	1.017	1.011	1.000	NA								
ARITH 5	7.028	1.627	1.196	1.175	1.052	1.072	1.083	1.058	1.053	1.021	1.089	1.031	1.034	1.042	1.039	1.033	1.025	1.019	1.015	1.012	1.017	1.011	1.000	NA								
ARITH ALL	9.384	1.954	1.321	1.240	1.132	1.097	1.073	1.577	1.069	1.039	1.084	1.032	1.037	1.038	1.038	1.026	1.023	1.016	1.015	1.012	1.017	1.011	1.000	NA								
5 YR HI LO	5.111	1.540	1.135	1.138	1.055	1.077	1.067	1.050	1.056	1.022	1.062	1.026	1.032	1.041	1.032	1.029	1.019	1.019	1.014	1.013	1.023	NA	NA	NA								
7 YR HI LO	7.086	1.660	1.125	1.152	1.101	1.074	1.054	1.045	1.061	1.026	1.057	1.029	1.029	1.034	1.026	1.027	1.019	1.016	1.014	1.013	1.023	NA	NA	NA								
ALL YR HI LO	7.825	1.901	1.274	1.204	1.122	1.091	1.071	1.067	1.070	1.037	1.075	1.031	1.036	1.037	1.034	1.024	1.019	1.016	1.014	1.013	1.023	NA	NA	NA								
SELECTED	4.292	1.519	1.135	1.138	1.055	1.071	1.064	1.046	1.071	1.027	1.084	1.032	1.036	1.036	1.031	1.028	1.025	1.020	1.027	1.019	1.016	1.014	1.012	1.010								

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Paid Losses

	Development in Months																							
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	40,315	835,499	2,728,718	6,568,905	13,373,754	18,845,618	23,820,837	27,664,147	31,626,348	34,871,004	37,747,448	40,455,899	42,534,558	45,765,782	48,568,937	50,658,185	52,285,341	53,882,728	55,011,326	56,923,526	58,124,590	59,473,654	60,816,782	62,160,910
1997	61,400	1,033,729	2,118,455	3,394,699	4,296,273	4,951,705	5,303,380	5,403,843	5,623,039	5,851,196	5,972,517	6,542,594	6,722,493	6,993,563	7,314,218	7,443,710	7,541,990	7,586,859	7,674,403	7,767,216	7,828,234	7,896,289	7,964,344	8,032,399
1998	239,795	3,032,700	6,094,264	8,178,370	9,375,140	10,068,463	10,602,282	10,912,410	11,684,792	12,096,844	13,060,306	13,727,870	14,499,065	14,951,449	15,319,415	15,575,277	15,862,219	16,158,393	16,312,830	16,500,587	16,792,391	17,084,195	17,375,999	17,667,803
1999	436,835	2,105,831	2,641,761	3,370,046	3,998,601	4,527,780	4,638,276	4,843,173	5,032,565	5,366,728	5,917,688	6,249,511	6,450,553	6,574,295	6,705,452	6,809,966	6,893,063	6,982,923	7,144,639	7,276,048	7,407,457	7,538,866	7,670,275	7,801,684
2000	1,404,622	3,256,938	4,590,454	5,519,248	6,451,995	7,193,747	7,750,786	8,836,291	9,135,094	9,627,642	10,050,268	10,330,492	10,607,398	10,934,896	11,265,746	11,608,205	11,922,692	12,218,748	12,583,946	12,949,144	13,314,342	13,679,540	14,044,738	14,409,936
2001	147,472	476,981	604,628	813,801	911,192	1,074,243	1,252,777	1,447,406	1,609,378	1,685,756	1,773,480	1,839,082	1,870,679	1,904,981	1,922,955	2,005,524	2,135,112	2,264,700	2,394,288	2,523,876	2,653,464	2,783,052	2,912,640	3,042,228
2002	47,379	480,361	1,014,084	1,140,741	1,308,579	1,402,608	1,531,018	1,591,392	1,659,124	1,814,667	1,875,002	1,960,925	2,114,181	2,204,070	2,358,085	2,569,598	2,737,830	2,906,062	3,074,294	3,242,526	3,410,758	3,578,990	3,747,222	3,915,454
2003	71,422	201,172	317,027	378,728	435,080	491,064	565,402	600,804	630,373	686,253	708,407	762,255	784,155	833,873	881,870	925,066	968,262	1,011,458	1,054,654	1,097,850	1,141,046	1,184,242	1,227,438	1,270,634
2004	84,160	401,722	532,740	728,973	887,261	1,008,297	1,120,106	1,186,075	1,229,393	1,286,274	1,327,154	1,384,142	1,404,444	1,456,535	1,508,295	1,560,055	1,611,815	1,663,575	1,715,335	1,767,095	1,818,855	1,870,615	1,922,375	1,974,135
2005	115,085	394,303	570,217	906,812	1,053,062	1,275,950	1,444,651	1,497,871	1,556,506	1,704,631	1,773,966	2,236,223	2,315,908	2,334,050										
2006	8,574	37,183	143,721	203,989	274,938	288,877	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938										
2007	2,861	119,076	363,029	442,968	537,077	674,872	743,159	803,483	916,913	1,006,421	1,008,109	1,076,420												
2008	60,614	254,231	266,381	320,759	400,143	502,530	517,750	562,296	587,385	596,073	615,335													
2009	93,362	282,127	442,836	504,349	532,197	540,101	592,613	612,576	623,399	659,857														
2010	-	125,006	229,422	248,031	338,015	353,987	378,531	446,308	485,492															
2011	120,046	332,076	612,202	684,075	752,341	813,135	874,773	904,905																
2012	9,999	133,785	188,289	213,486	235,093	249,801	271,398																	
2013	43,387	221,753	340,269	510,062	602,181	636,244																		
2014	18,035	250,466	420,375	484,944	548,829																			
2015	-	37,773	84,716	91,292																				
2016	-	275,228	350,684																					
2017	141,856	295,863																						
2018	73,595																							

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	114,027	114,027	114,027	-	-	-
1996	67,818,570	60,816,782	67,147,099	6,330,317	671,471	7,001,788
1997	8,710,315	8,056,789	8,662,253	605,464	48,062	653,526
1998	19,151,801	16,792,391	18,971,581	2,179,191	180,220	2,359,410
1999	8,126,510	7,276,048	8,039,539	763,491	86,971	850,463
2000	15,194,204	12,583,946	14,987,967	2,404,021	206,236	2,610,258
2001	3,485,098	2,135,112	3,425,000	1,280,889	60,098	1,349,986
2002	3,490,517	2,737,830	3,340,765	602,935	149,753	752,687
2003	1,163,566	925,066	1,107,025	181,959	56,540	238,500
2004	2,167,660	1,508,295	2,037,947	529,652	129,713	659,365
2005	3,037,513	2,334,050	2,778,623	444,573	258,890	703,463
2006	592,007	300,038	533,938	233,000	58,069	291,069
2007	1,472,234	1,076,420	1,302,593	226,173	169,641	395,814
2008	725,305	615,335	634,174	18,839	91,131	109,971
2009	885,617	659,857	774,343	114,485	111,274	225,759
2010	1,024,476	485,492	886,809	401,317	137,667	538,985
2011	2,088,904	964,905	1,773,194	868,290	315,710	1,184,000
2012	430,973	271,398	360,480	89,082	70,494	159,575
2013	1,280,640	636,244	1,061,991	425,747	218,648	644,396
2014	938,415	548,829	731,229	182,400	207,186	389,586
2015	302,923	91,292	222,633	131,341	80,290	211,631
2016	1,214,312	350,684	868,811	518,127	345,501	863,628
2017	991,881	295,863	662,913	367,050	328,968	696,018
2018	1,193,420	73,595	582,223	508,627	611,198	1,119,825
TOTAL	145,600,888	121,591,186	141,007,156	19,415,970	4,593,732	24,009,702

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Development of Losses to Ultimate

RY	Development Period in Months																		ULT
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	
1994																			1,000
1995	1,000	1,000	1,000	1,000	1,000	1,000	1,000	3,677	1,000	1,321	1,000	1,000	1,000	1,000	0,939	1,000	1,000	1,000	1,000
1996	0,902	1,033	0,991	1,067	1,057	1,024	1,022	0,986	0,975	1,004	0,996	1,019	1,016	1,030	1,013	1,015	1,034	1,021	1,013
1997	1,419	1,119	1,165	1,129	1,028	1,003	0,954	0,965	1,030	1,099	0,987	1,020	1,012	1,040	1,008	1,002	1,017	1,000	1,012
1998	1,204	1,386	1,084	1,038	1,045	0,968	1,004	1,048	1,012	1,016	1,052	1,024	1,027	1,042	1,012	1,001	1,040	1,005	0,996
1999	1,388	1,027	0,939	1,053	0,966	0,914	0,986	1,021	1,015	1,032	1,011	1,048	1,002	0,997	0,991	1,001	1,023	1,003	0,977
2000	1,144	1,133	1,038	0,934	0,926	1,063	1,055	1,053	1,020	0,993	0,996	1,031	1,010	1,012	1,023	1,018	1,007	1,029	1,003
2001	0,886	1,044	0,843	0,979	1,083	1,103	1,103	1,046	0,957	1,000	0,983	1,011	1,017	1,019	1,000	1,002	1,300	1,004	1,003
2002	1,056	1,093	0,912	0,932	1,005	1,041	0,957	1,018	1,185	1,082	0,991	0,983	1,010	1,074	1,000	0,999	1,027	1,004	1,003
2003	0,768	1,061	0,829	0,946	0,999	1,044	0,979	1,036	1,062	1,015	1,033	0,999	1,018	0,960	1,011	1,006	1,027	1,004	1,003
2004	0,792	0,965	1,015	1,055	0,994	0,990	0,960	1,022	0,990	0,965	1,018	0,990	1,034	1,125	1,012	1,006	1,027	1,004	1,003
2005	0,933	0,960	1,098	0,982	1,011	0,876	1,016	1,012	1,006	0,990	1,012	0,993	1,008	1,028	1,012	1,006	1,027	1,004	1,003
2006	0,767	0,851	0,950	1,035	0,886	0,992	1,000	1,000	1,000	0,889	1,332	1,014	1,028	1,028	1,012	1,006	1,027	1,004	1,003
2007	0,911	1,068	1,001	0,914	1,102	1,090	1,075	1,047	0,964	1,000	1,030	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2008	0,755	0,932	0,985	1,262	1,008	1,025	0,999	1,000	0,961	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2009	1,125	0,974	0,970	0,998	1,031	1,010	0,995	1,000	0,975	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2010	0,696	0,950	0,912	1,001	0,981	1,000	0,974	1,023	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2011	1,126	1,158	0,990	1,312	1,043	1,000	1,005	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2012	1,075	0,851	1,037	0,721	1,037	0,995	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2013	0,916	1,273	1,078	1,013	1,113	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2014	1,190	0,875	1,022	0,977	1,064	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2015	1,537	0,675	0,868	1,060	1,064	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2016	2,647	1,049	1,027	1,060	1,064	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2017	1,426	1,071	1,027	1,060	1,064	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003
2018	1,370	1,071	1,027	1,060	1,064	1,009	1,015	1,020	1,010	1,000	1,012	1,019	1,014	1,028	1,012	1,006	1,027	1,004	1,003

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994																										
1995	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	91,936	91,936	121,424	121,424	121,424	121,424	121,424	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027
1996	53,531,127	48,276,728	49,847,528	49,416,091	52,753,131	55,738,298	57,091,009	58,374,713	57,572,078	56,151,497	56,390,043	56,178,169	57,273,389	58,214,908	59,977,748	60,770,990	61,688,931	63,792,668	65,150,171	65,977,887	66,150,235	66,410,152	67,147,099	67,818,570	67,818,570	67,818,570
1997	3,488,066	4,948,408	5,536,941	6,451,250	7,281,588	7,485,500	7,508,968	7,162,148	6,910,221	7,116,889	7,823,237	7,718,570	7,871,255	7,964,060	8,283,527	8,349,349	8,364,780	8,504,335	8,506,854	8,608,821	8,540,554	8,662,253	8,710,315	8,710,315	8,710,315	8,710,315
1998	7,409,437	8,921,577	12,369,029	13,404,188	13,919,877	14,550,902	14,092,048	14,149,777	14,829,092	15,013,956	15,259,044	16,052,593	16,444,809	16,896,144	17,597,797	17,814,255	17,835,695	18,556,400	18,647,583	18,568,571	18,971,581	19,046,124	19,151,801	19,151,801	19,151,801	19,151,801
1999	5,779,938	8,024,566	8,241,907	7,737,024	8,143,655	7,865,584	7,192,692	7,094,802	7,246,091	7,355,843	7,859,540	8,674,873	8,045,876	8,059,649	8,632,190	7,960,409	7,938,497	8,144,204	7,960,286	8,039,539	8,050,039	8,081,670	8,126,510	8,126,510	8,126,510	8,126,510
2000	9,506,730	10,878,161	12,327,020	12,796,309	11,952,953	11,069,344	11,764,305	12,407,735	13,064,765	13,323,241	13,326,077	13,183,944	13,594,880	13,725,657	13,890,845	14,208,532	14,461,978	14,567,342	14,987,967	15,031,593	15,051,225	15,110,365	15,194,204	15,194,204	15,194,204	15,194,204
2001	3,317,183	2,939,870	3,070,598	2,530,610	2,534,088	2,214,767	2,397,889	2,643,844	2,764,441	2,644,331	2,710,539	2,709,650	2,664,160	2,536,752	2,580,388	2,629,369	2,635,271	3,425,000	3,437,794	3,447,800	3,452,303	3,465,868	3,485,098	3,485,098	3,485,098	
2002	2,797,972	2,955,239	2,845,096	2,594,519	2,418,970	2,430,893	2,530,221	2,421,288	2,465,405	2,923,043	3,160,884	3,133,768	3,081,785	3,114,120	3,344,801	3,344,801	3,340,765	3,430,326	3,443,139	3,453,161	3,457,671	3,471,257	3,490,517	3,490,517	3,490,517	
2003	1,489,298	1,143,640	1,213,936	1,006,896	952,160	951,366	993,623	972,568	1,007,453	1,070,316	1,086,373	1,121,830	1,121,173	1,141,225	1,095,113	1,107,025	1,113,646	1,143,501	1,147,772	1,151,113	1,152,617	1,157,145	1,163,566	1,163,566	1,163,566	
2004	2,301,364	1,823,715	1,760,490	1,786,563	1,884,943	1,873,520	1,854,994	1,780,953	1,820,297	1,801,844	1,739,255	1,770,350	1,752,809	1,811,564	2,097,947	2,062,328	2,074,662	2,130,281	2,138,238	2,144,461	2,147,262	2,155,699	2,167,660	2,167,660	2,167,660	
2005	3,138,114	2,929,139	2,810,581	3,086,814	3,030,308	3,062,220	2,681,318	2,723,317	2,755,742	2,771,583	2,744,820	2,777,459	2,757,862	2,778,623	2,855,747	2,889,912	2,907,195	2,985,133	2,996,283	3,005,005	3,008,929	3,020,752	3,037,513	3,037,513	3,037,513	
2006	800,017	613,381	522,074	495,901	513,397	454,750	450,939	450,939	450,939	450,939	450,939	400,939	533,938	541,550	556,581	563,240	566,608	581,798	583,971	585,671	586,436	588,740	592,007	592,007	592,007	
2007	1,090,014	993,082	1,060,685	1,062,066	970,948	1,070,209	1,166,127	1,253,301	1,312,571	1,264,959	1,302,593	1,327,825	1,346,754	1,384,135	1,400,694	1,409,071	1,446,846	1,452,250	1,456,478	1,458,380	1,464,110	1,472,234	1,472,234	1,472,234	1,472,234	
2008	731,009	551,962	514,640	506,914	639,744	644,925	660,008	660,233	660,233	660,233	634,174	641,731	646,151	663,487	681,903	690,061	694,188	712,798	715,460	717,543	718,480	721,303	725,305	725,305	725,305	
2009	722,859	813,160	792,224	768,528	767,285	790,728	798,504	794,123	794,123	774,343	774,343	783,570	798,748	810,135	832,621	842,582	847,621	870,345	873,596	876,139	877,283	880,730	885,617	885,617	885,617	
2010	1,501,515	1,045,356	993,470	905,640	906,778	889,689	889,689	866,612	886,809	895,755	895,755	906,429	937,159	937,159	963,171	974,694	980,523	1,006,810	1,010,570	1,013,512	1,014,836	1,018,823	1,024,476	1,024,476	1,024,476	
2011	999,032	1,125,045	1,302,535	1,288,969	1,691,617	1,763,581	1,763,581	1,773,194	1,808,201	1,826,443	1,826,443	1,848,207	1,884,008	1,910,865	1,963,904	1,987,399	1,999,285	2,052,883	2,060,551	2,066,549	2,069,248	2,077,378	2,088,904	2,088,904	2,088,904	
2012	510,805	499,280	467,534	484,868	349,610	362,382	360,480	365,837	373,060	376,823	381,314	388,700	394,241	405,184	410,031	412,483	423,542	425,124	426,361	426,918	428,295	430,973	430,973	430,973	430,973	
2013	749,010	686,060	873,521	907,049	954,124	1,061,991	1,071,167	1,087,088	1,108,550	1,119,733	1,119,733	1,133,076	1,155,024	1,17												

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Selection of Loss Development Factors

RY	Development Period in Months																															
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300								
1994												Excluded																				
1995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	3.677	1.000	1.321	1.000	1.000	1.000	1.000	0.939	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
1996	0.902	1.033	0.991	1.067	1.057	1.024	1.022	0.986	0.975	1.004	0.996	1.019	1.016	1.030	1.013	1.015	1.034	1.021	1.013	1.003	1.004	1.011	1.011									
1997	1.419	1.119	1.165	1.129	1.028	1.003	0.954	0.965	1.030	1.099	0.987	1.020	1.012	1.040	1.008	1.002	1.017	1.000	1.012	0.992	1.014											
1998	1.204	1.386	1.084	1.038	1.045	0.968	1.004	1.048	1.012	1.016	1.052	1.024	1.027	1.042	1.012	1.001	1.040	1.005	0.996	1.022												
1999	1.388	1.027	0.939	1.053	0.966	0.914	0.986	1.021	1.015	1.032	1.011	1.048	1.002	0.997	0.991	1.000	1.023	0.977	1.010													
2000	1.144	1.133	1.038	0.934	0.926	1.063	1.055	1.053	1.020	0.993	0.996	1.031	1.010	1.012	1.023	1.018	1.007	1.029														
2001	0.886	1.044	0.843	0.979	0.874	1.083	1.103	1.046	0.957	1.025	1.000	0.983	0.953	1.017	1.019	1.002	1.300															
2002	1.056	0.963	0.912	0.932	1.005	1.041	0.957	1.018	1.185	1.082	0.991	0.983	1.010	1.074	1.000	0.999																
2003	0.768	1.061	0.829	0.946	0.999	1.044	0.979	1.036	1.062	1.015	1.033	0.999	1.018	0.960	1.011																	
2004	0.792	0.965	1.015	1.055	0.994	0.990	0.960	1.022	0.990	0.965	1.018	0.990	1.034	1.125																		
2005	0.933	0.960	1.098	0.982	1.011	0.876	1.016	1.012	1.006	0.990	1.012	0.993	1.008																			
2006	0.767	0.851	0.950	1.035	0.886	0.992	1.000	1.000	1.000	0.889	1.332																					
2007	0.911	1.068	1.001	0.914	1.102	1.090	1.075	1.047	0.964	1.000	1.030																					
2008	0.755	0.932	0.985	1.262	1.008	1.025	0.999	1.000	0.961	1.000																						
2009	1.125	0.974	0.970	0.998	1.031	1.010	0.995	1.000	0.975																							
2010	0.696	0.950	0.912	1.001	0.981	1.000	0.974	1.023																								
2011	1.126	1.158	0.990	1.312	1.043	1.000	1.005																									
2012	1.075	0.851	1.037	0.721	1.037	0.995																										
2013	0.916	1.273	1.078	1.013	1.113																											
2014	1.190	0.875	1.022	0.977																												
2015	1.537	0.675	0.868																													
2016	2.647	1.049																														
2017	1.426																															
VOL WTD 3	1.826	0.908	1.027	0.935	1.064	0.999	0.995	1.009	0.966	1.000	1.005	1.019	1.018	1.068	1.009	1.013	1.043	1.008	1.003	1.005	1.005	1.011	1.000	NA								
VOL WTD 5	1.370	0.975	1.015	1.060	1.043	1.005	1.013	1.020	0.987	0.987	1.012	1.005	1.000	1.028	1.011	1.006	1.038	1.015	1.009	1.005	1.005	1.011	1.000	NA								
VOL WTD ALL	1.003	1.071	1.007	1.040	1.023	1.009	1.015	1.007	0.997	1.014	1.005	1.021	1.014	1.030	1.012	1.010	1.036	1.015	1.009	1.005	1.005	1.011	1.000	NA								
ARITH 3	1.870	0.866	0.989	0.904	1.064	0.998	0.991	1.008	0.966	1.000	0.977	1.105	1.020	1.053	1.010	1.006	1.110	1.004	1.006	1.005	1.006	1.006	1.000	NA								
ARITH 5	1.543	0.945	0.999	1.005	1.041	1.006	1.010	1.014	0.981	0.991	0.996	1.060	1.004	1.038	1.009	1.004	1.077	1.007	1.006	1.004	1.006	1.006	1.000	NA								
ARITH ALL	1.116	1.016	0.987	1.017	1.005	1.007	1.005	1.185	1.010	1.039	1.001	1.035	1.008	1.030	1.002	1.005	1.060	1.005	1.006	1.004	1.006	1.006	1.000	NA								
5 YR HI LO	1.384	0.925	1.016	0.997	1.037	1.003	1.000	1.008	0.980	0.997	1.020	0.994	1.012	1.034	1.010	1.001	1.027	1.009	1.007	1.001	1.004	NA	NA	NA								
7 YR HI LO	1.271	0.977	0.986	1.050	1.044	1.006	1.003	1.012	0.987	1.001	1.010	0.999	1.021	1.038	1.004	1.007	1.028	1.007	1.007	1.001	1.004	NA	NA	NA								
ALL YR HI LO	1.063	1.014	0.986	1.018	1.007	1.010	1.002	1.022	1.001	1.021	1.007	1.011	1.011	1.026	1.008	1.003	1.024	1.007	1.007	1.001	1.004	NA	NA	NA								
SELECTED	1.370	1.071	1.027	1.060	1.064	1.009	1.015	1.020	1.010	1.000	1.012	1.019	1.014	1.028	1.012	1.006	1.027	1.004	1.003	1.001	1.004	1.006	1.000	1.000								

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Incurred Losses

RY	Development in Months																204	216	228	240	252	264	276	288
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192								
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	91,936	91,936	121,424	121,424	121,424	121,424	121,424	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027
1996	53,331,127	48,276,728	49,847,538	49,418,091	52,753,131	55,738,398	57,091,009	58,374,713	57,572,078	56,151,497	56,390,043	56,178,169	57,273,589	58,214,908	59,977,748	60,770,990	61,688,931	63,792,668	65,150,171	65,977,887	66,150,235	66,410,152	67,147,099	114,027
1997	3,488,066	4,948,408	5,536,941	6,451,250	7,281,588	7,485,500	7,508,968	7,162,148	6,910,221	7,116,889	7,823,237	7,718,570	7,871,255	7,964,060	8,283,527	8,349,349	8,364,780	8,504,335	8,506,854	8,608,821	8,540,554	8,662,253		
1998	7,409,437	8,921,577	12,369,029	13,404,188	13,919,877	14,550,902	14,092,048	14,149,777	14,829,092	15,013,956	15,259,044	16,052,593	16,444,809	16,896,144	17,597,797	17,814,255	17,835,695	18,556,400	18,647,583	18,568,571	18,971,581			
1999	5,779,938	8,024,566	8,241,907	7,737,024	8,143,655	7,865,684	7,192,692	7,094,802	7,246,091	7,355,843	7,589,350	7,674,873	8,045,876	8,059,649	8,032,190	7,960,409	7,958,497	8,144,204	7,960,286	8,039,539				
2000	9,506,730	10,878,161	12,327,020	12,796,309	11,952,953	11,069,344	11,764,305	12,407,735	13,064,765	13,323,241	13,236,077	13,183,944	13,594,880	13,725,657	13,890,845	14,208,532	14,461,978	14,567,342	14,987,967					
2001	3,317,183	2,939,870	3,070,598	2,589,610	2,534,088	2,214,767	2,397,889	2,643,844	2,764,441	2,644,331	2,710,539	2,709,650	2,663,160	2,536,752	2,580,388	2,629,369	2,635,271	3,425,000						
2002	2,797,972	2,955,239	2,845,096	2,594,519	2,418,970	2,430,893	2,530,221	2,421,288	2,465,465	2,921,043	3,160,884	3,133,768	3,081,785	3,114,120	3,344,801	3,344,801	3,340,765							
2003	1,489,298	1,143,640	1,213,936	1,006,896	952,160	951,366	993,623	972,568	1,007,453	1,070,316	1,086,373	1,121,830	1,121,173	1,141,225	1,095,113	1,107,025								
2004	2,301,364	1,823,715	1,760,490	1,786,563	1,884,943	1,873,520	1,854,994	1,780,593	1,820,297	1,801,844	1,739,255	1,770,350	1,752,809	1,811,564	2,037,947									
2005	3,138,114	2,929,139	2,810,581	3,086,814	3,030,308	3,062,220	2,681,318	2,723,317	2,755,742	2,771,583	2,744,820	2,777,459	2,757,862	2,778,623										
2006	800,017	613,381	522,074	495,801	513,397	454,750	450,939	450,939	450,939	450,939	450,939	450,939	400,939	533,938										
2007	1,090,014	993,082	1,060,685	1,062,066	970,948	1,070,209	1,166,127	1,253,301	1,312,571	1,264,959	1,264,959	1,302,593												
2008	731,009	551,962	534,640	506,914	639,744	644,925	660,908	660,233	660,233	634,174	634,174													
2009	722,859	813,160	792,224	768,528	767,285	790,728	798,504	794,123	794,123	774,343														
2010	1,501,515	1,045,356	993,470	905,640	906,778	889,689	889,689	866,612	886,809															
2011	999,032	1,125,045	1,302,535	1,288,969	1,691,617	1,763,581	1,763,581	1,773,194																
2012	510,805	549,280	467,534	484,868	349,610	362,382	360,480																	
2013	749,010	686,060	873,521	942,049	954,324	1,061,991																		
2014	704,012	837,531	732,853	748,791	731,229																			
2015	247,006	379,643	256,400	222,633																				
2016	313,008	828,611	868,811																					
2017	465,000	662,913																						
2018	582,223																							

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial UST
Determination of Pure Premium

(1) RY	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) SELECTED <u>ULTIMATE</u>	(5) POTENTIAL <u>SITES</u>	(6) PURE <u>PREMIUM</u>
2008	966,979	725,305	846,142	12,021	70
2009	1,064,734	885,617	975,175	12,003	81
2010	886,809	1,024,476	955,642	11,973	80
2011	1,773,194	2,088,904	1,931,049	11,936	162
2012	522,057	430,973	476,515	11,915	40
2013	1,311,204	1,280,640	1,295,922	11,887	109
2014	1,193,782	938,415	1,066,099	11,853	90
2015	225,947	302,923	264,435	11,834	22
2016	985,060	1,214,312	1,099,686	11,810	93
2017	1,262,204	991,881	1,127,042	11,791	96
2018	1,347,600	1,193,420	1,270,510	11,777	108
TOTAL	11,539,571	11,076,866	11,308,218	130,800	86

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
UST Remedial Claims
Paid Bornhuetter-Ferguson Method

(1) RY	(2) POTENTIAL SITES	(3) PROJECTED PURE PREM	(4) TRENDED PURE PREM	(5) DETRENDED PURE PREM	(6) EXPECTED LOSSES	(7) PERCENT UNPAID	(8) EXPECTED UNPAID	(9) PAID LOSSES	(10) INDICATED ULTIMATE	(11) INCURRED LOSSES	(12) IBNR RESERVE	(13) CASE RESERVE	(14) ULTIMATE PURE PREM
2008	12,021	70	70	93	1,116,523	36.4%	406,026	615,335	1,021,361	634,174	387,187	18,839	85
2009	12,003	81	81	93	1,114,851	38.0%	423,934	659,857	1,083,792	774,343	309,449	114,485	90
2010	11,973	80	80	93	1,112,065	42.1%	468,539	485,492	954,030	886,809	67,221	401,317	80
2011	11,936	162	162	93	1,108,628	44.7%	495,492	904,905	1,400,397	1,773,194	(372,798)	868,290	117
2012	11,915	40	40	93	1,106,678	48.0%	531,357	271,398	802,755	360,480	442,276	89,082	67
2013	11,887	109	109	93	1,104,077	51.5%	568,338	636,244	1,204,583	1,061,991	142,591	425,747	101
2014	11,853	90	90	93	1,100,919	54.0%	594,783	548,829	1,143,612	731,229	412,383	182,400	96
2015	11,834	22	22	93	1,099,154	59.6%	655,050	91,292	746,342	222,633	523,709	131,341	63
2016	11,810	93	93	93	1,096,925	64.4%	706,417	350,684	1,057,101	868,811	188,290	518,127	90
2017	11,791	96	96	93	1,095,160	76.6%	838,452	295,863	1,134,316	662,913	471,403	367,050	96
2018	11,777	108	108	93	1,093,860	94.5%	1,034,122	73,595	1,107,717	582,223	525,495	508,627	94
TOTAL	130,800				12,148,841		6,722,511	4,933,494	11,656,005	8,558,798	3,097,207	3,625,304	89

<u>Pure Premium Selection</u>		Trend =	1.000
3-Year Average x Latest	70		
5-Year Average x Latest	82		
All Year Average x Latest	84		
Selected Pure Premium	93	Average of 2014, 2016, 2017	

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
UST Remedial Claims
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<u>RY</u>	<u>POTENTIAL SITES</u>	<u>PROJECTED PURE PREM</u>	<u>TRENDED PURE PREM</u>	<u>DETRENDED PURE PREM</u>	<u>EXPECTED LOSSES</u>	<u>PERCENT IBNR</u>	<u>EXPECTED IBNR</u>	<u>INCURRED LOSSES</u>	<u>INDICATED ULTIMATE</u>	<u>PAID LOSSES</u>	<u>UNPAID LOSS</u>	<u>CASE RESERVE</u>	<u>ULTIMATE PURE PREM</u>
2008	12,021	70	70	93	1,116,523	12.6%	140,286	634,174	774,460	615,335	159,125	18,839	64
2009	12,003	81	81	93	1,114,851	12.6%	140,076	774,343	914,419	659,857	254,562	114,485	76
2010	11,973	80	80	93	1,112,065	13.4%	149,437	886,809	1,036,246	485,492	550,755	401,317	87
2011	11,936	162	162	93	1,108,628	15.1%	167,554	1,773,194	1,940,749	904,905	1,035,844	868,290	163
2012	11,915	40	40	93	1,106,678	16.4%	181,018	360,480	541,498	271,398	270,100	89,082	45
2013	11,887	109	109	93	1,104,077	17.1%	188,503	1,061,991	1,250,494	636,244	614,250	425,747	105
2014	11,853	90	90	93	1,100,919	22.1%	243,064	731,229	974,293	548,829	425,464	182,400	82
2015	11,834	22	22	93	1,099,154	26.5%	291,333	222,633	513,965	91,292	422,673	131,341	43
2016	11,810	93	93	93	1,096,925	28.5%	312,102	868,811	1,180,912	350,684	830,228	518,127	100
2017	11,791	96	96	93	1,095,160	33.2%	363,222	662,913	1,026,135	295,863	730,271	367,050	87
2018	11,777	108	108	93	1,093,860	51.2%	560,209	582,223	1,142,432	73,595	1,068,836	508,627	97
TOTAL	130,800				12,148,841		2,736,805	8,558,798	11,295,603	4,933,494	6,362,109	3,625,304	86

<u>Pure Premium Selection</u>	Trend =	1.000
3-Year Average x Latest		70
5-Year Average x Latest		82
All Year Average x Latest		84
Selected Pure Premium		93

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	478,042	478,042	478,042	-	-	-
1999	2,690,066	2,532,094	2,689,230	157,136	836	157,972
2000	1,195,793	1,195,793	1,195,793	-	-	-
2001	6,664,686	5,757,861	6,664,686	906,825	-	906,825
2002	2,382,845	1,692,921	2,382,845	689,924	-	689,924
2003	1,543,256	1,276,743	1,543,256	266,513	-	266,513
2004	3,064,971	2,645,562	2,845,405	199,843	219,566	419,409
2005	2,175,022	1,616,331	2,175,022	558,691	-	558,691
2006	2,166,914	1,755,125	2,138,100	382,976	28,814	411,790
2007	1,473,322	1,150,527	1,194,026	43,499	279,296	322,795
2008	752,679	554,141	580,153	26,011	172,526	198,538
2009	1,082,577	758,059	982,683	224,624	99,894	324,518
2010	725,760	466,760	725,760	259,000	-	259,000
2011	1,328,055	815,994	935,802	119,808	392,253	512,062
2012	3,201,767	1,849,816	2,451,291	601,475	750,476	1,351,951
2013	1,679,661	909,739	1,158,669	248,930	520,992	769,922
2014	817,642	74,003	817,642	743,639	-	743,639
2015	825,614	359,484	723,985	364,501	101,629	466,130
2016	2,057,290	727,719	1,407,791	680,072	649,498	1,329,570
2017	3,004,613	771,285	3,004,613	2,233,328	-	2,233,328
2018	1,743,650	153,788	1,743,650	1,589,862	-	1,589,862
TOTAL	41,054,224	27,541,785	37,838,443	10,296,657	3,215,781	13,512,438

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Development of Losses to Ultimate

RY	Development Period in Months																		300 - ULT							
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300		
1994																									1,000	1,037
1995																								1,004		1,037
1996																								1,004		1,037
1997																								1,004		1,037
1998		1,000	1,000	1,000	1,000	1,000	1,000	1,000	4,669	2,231	2,058	1,148	1,066	1,091	1,000	1,000	1,000	1,000	1,000	1,000	1,006	1,005	1,004	1,000		1,037
1999	15,900	1,244	2,319	1,021	1,004	1,011	1,041	1,014	1,085	1,078	1,058	1,037	1,005	1,016	1,000	1,124	1,000	1,001	1,000	1,008	1,006	1,005	1,004	1,000		1,037
2000	1,761	1,262	1,034	1,014	1,018	1,108	1,028	1,038	1,083	1,014	1,013	1,025	1,001	1,010	1,000	1,000	1,000	1,010	1,008	1,006	1,005	1,004	1,000	1,000		1,037
2001	1,541	1,087	1,075	1,093	1,050	1,021	1,028	1,099	1,106	1,029	1,266	1,019	1,043	1,029	1,094	1,027	1,021	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2002	10,706	2,111	1,228	1,161	1,078	1,049	1,133	1,134	1,168	1,037	1,019	1,010	1,052	1,053	1,024	1,009	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2003	3,306	1,453	1,561	1,192	1,187	1,137	1,043	1,129	1,051	1,067	1,192	1,050	1,041	1,048	1,064	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2004	3,116	1,474	1,254	1,298	1,343	1,122	1,032	1,102	1,122	1,044	1,055	1,050	1,020	1,011	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2005	11,692	1,138	1,099	1,080	1,052	1,048	1,018	1,026	1,008	1,008	1,017	1,032	1,094	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2006	4,502	1,556	1,611	1,283	1,183	1,035	1,111	1,026	1,092	1,151	1,063	1,076	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2007	3,306	1,594	1,127	1,341	1,099	1,033	1,053	1,050	1,036	1,016	1,021	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2008	2,474	1,276	1,351	1,158	1,027	1,067	1,100	1,125	1,050	1,023	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2009	10,467	1,861	1,934	1,065	1,456	1,254	1,238	1,223	1,089	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2010	4,034	1,182	1,691	1,078	1,324	1,134	1,340	1,062	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2011	3,325	1,526	1,081	1,124	1,092	1,068	1,074	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2012	1,608	1,402	1,175	1,175	1,088	1,109	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2013	3,828	1,585	1,391	1,080	1,118	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2014	1,000	6,122	3,205	1,209	1,104	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2015	4,922	1,606	1,295	1,126	1,104	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2016	3,867	1,284	1,231	1,126	1,104	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2017	5,527	1,324	1,231	1,126	1,104	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037
2018	2,715	1,324	1,231	1,126	1,104	1,067	1,063	1,077	1,058	1,051	1,061	1,037	1,037	1,028	1,029	1,020	1,016	1,013	1,010	1,008	1,006	1,005	1,004	1,000	1,000	1,037

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT	
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1998	-	16,713	16,713	16,713	16,713	16,713	16,713	16,713	16,713	78,028	174,102	358,349	411,237	438,258	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	481,140	483,635	485,641	485,641	503,785
1999	34,176	543,408	676,196	1,567,972	1,601,529	1,608,182	1,625,584	1,692,876	1,717,189	1,863,780	2,008,295	2,125,717	2,204,155	2,214,424	2,250,269	2,250,269	2,529,597	2,529,597	2,529,597	2,532,094	2,532,094	2,552,607	2,569,150	2,582,471	2,593,183	2,593,183	2,690,066
2000	370,129	651,957	822,756	850,390	862,198	877,375	971,906	999,462	1,037,135	1,123,070	1,139,298	1,154,165	1,182,661	1,184,428	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,207,903	1,217,688	1,225,580	1,231,935	1,237,045	1,237,045	1,283,261	
2001	1,334,769	2,056,418	2,236,336	2,404,395	2,628,060	2,759,085	2,817,023	2,896,871	3,183,541	3,519,996	3,623,500	4,589,112	4,674,733	4,876,595	5,018,242	5,488,608	5,638,087	5,757,861	5,830,746	5,889,792	5,937,507	5,975,988	6,006,973	6,031,889	6,031,889	6,257,244	
2002	25,391	271,845	573,933	704,799	818,350	881,841	924,693	1,047,264	1,187,136	1,386,044	1,436,815	1,464,223	1,479,159	1,556,347	1,638,304	1,677,022	1,692,921	1,719,708	1,741,476	1,759,112	1,773,363	1,784,856	1,794,110	1,801,552	1,801,552	1,868,859	
2003	55,198	182,491	265,162	413,872	493,384	585,783	665,773	694,461	783,706	823,855	878,721	1,047,401	1,100,227	1,145,541	1,200,282	1,276,743	1,301,995	1,322,597	1,339,338	1,352,901	1,363,862	1,372,701	1,379,818	1,385,542	1,385,542	1,437,306	
2004	154,438	481,188	709,451	889,323	1,154,237	1,550,136	1,738,876	1,795,147	1,978,584	2,219,493	2,316,258	2,443,349	2,565,442	2,616,804	2,645,562	2,722,579	2,776,428	2,820,359	2,856,060	2,884,983	2,908,355	2,927,204	2,942,381	2,954,586	2,954,586	3,064,971	
2005	76,161	890,444	1,013,676	1,114,425	1,203,629	1,266,271	1,326,703	1,350,155	1,385,185	1,396,276	1,407,470	1,431,885	1,477,651	1,616,331	1,661,565	1,709,937	1,743,757	1,771,348	1,793,770	1,811,935	1,826,614	1,838,453	1,847,985	1,855,650	1,855,650	1,924,978	
2006	60,491	272,313	423,641	682,375	875,535	1,035,779	1,072,081	1,190,682	1,221,925	1,334,084	1,534,980	1,631,669	1,755,125	1,819,476	1,870,395	1,924,945	1,962,916	1,993,975	2,019,216	2,039,664	2,056,188	2,069,514	2,080,244	2,088,873	2,088,873	2,166,914	
2007	107,082	353,965	564,316	635,862	852,470	936,817	967,505	1,018,844	1,069,756	1,108,422	1,126,553	1,150,527	1,193,339	1,237,092	1,271,713	1,308,735	1,334,620	1,355,738	1,372,899	1,386,802	1,398,037	1,407,098	1,414,393	1,420,260	1,420,260	1,473,322	
2008	76,453	189,175	241,331	325,929	380,673	391,046	417,098	458,918	516,229	541,900	554,141	587,772	609,644	631,996	649,683	668,596	681,820	692,609	701,376	708,478	714,218	718,847	722,574	725,571	725,571	752,679	
2009	6,274	65,671	122,193	236,292	251,768	366,562	459,776	569,158	696,182	758,059	797,020	845,392	876,849	908,999	934,437	961,641	980,661	996,177	1,008,787	1,019,003	1,027,258	1,033,916	1,039,277	1,043,588	1,043,588	1,082,577	
2010	25,118	101,329	119,772	202,531	218,274	289,061	327,938	439,479	466,760	493,949	519,336	550,855	571,352	592,301	608,876	626,602	638,995	649,106	657,323	663,979	669,358	673,696	677,190	679,998	679,998	705,404	
2011	105,665	351,316	535,992	579,582	651,347	711,550	759,749	815,994	878,763	929,952	977,748	1															

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Selection of Loss Development Factors

	Development Period in Months																				Excluded			
RY	<u>12 - 24</u>	<u>24 - 36</u>	<u>36 - 48</u>	<u>48 - 60</u>	<u>60 - 72</u>	<u>72 - 84</u>	<u>84 - 96</u>	<u>96 - 108</u>	<u>108 - 120</u>	<u>120 - 132</u>	<u>132 - 144</u>	<u>144 - 156</u>	<u>156 - 168</u>	<u>168 - 180</u>	<u>180 - 192</u>	<u>192 - 204</u>	<u>204 - 216</u>	<u>216 - 228</u>	<u>228 - 240</u>	<u>240 - 252</u>	<u>252 - 264</u>	<u>264 - 276</u>	<u>276 - 288</u>	<u>288 - 300</u>
1994																								
1995																								
1996																								
1997																								
1998		1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.669	2.231	2.058	1.148	1.066	1.091	1.000	1.000	1.000	1.000	1.000	1.000				
1999	15.900	1.244	2.319	1.021	1.004	1.011	1.041	1.014	1.085	1.078	1.058	1.037	1.005	1.016	1.000	1.124	1.000	1.001	1.000					
2000	1.761	1.262	1.034	1.014	1.018	1.108	1.028	1.038	1.083	1.014	1.013	1.025	1.001	1.010	1.000	1.000	1.000	1.000	1.000					
2001	1.541	1.087	1.075	1.093	1.050	1.021	1.028	1.099	1.106	1.029	1.266	1.019	1.043	1.029	1.094	1.027	1.021							
2002	10.706	2.111	1.228	1.161	1.078	1.049	1.133	1.134	1.168	1.037	1.019	1.010	1.052	1.053	1.024	1.009								
2003	3.306	1.453	1.561	1.192	1.187	1.137	1.043	1.129	1.051	1.067	1.192	1.050	1.041	1.048	1.064									
2004	3.116	1.474	1.254	1.298	1.343	1.122	1.032	1.102	1.122	1.044	1.055	1.050	1.020	1.011										
2005	11.692	1.138	1.099	1.080	1.052	1.048	1.018	1.026	1.008	1.008	1.017	1.032	1.094											
2006	4.502	1.556	1.611	1.283	1.183	1.035	1.111	1.026	1.092	1.151	1.063	1.076												
2007	3.306	1.594	1.127	1.341	1.099	1.033	1.053	1.050	1.036	1.016	1.021													
2008	2.474	1.276	1.351	1.168	1.027	1.067	1.100	1.125	1.050	1.023														
2009	10.467	1.861	1.934	1.065	1.456	1.254	1.238	1.223	1.089															
2010	4.034	1.182	1.691	1.078	1.324	1.134		1.062																
2011	3.325	1.526	1.081	1.124	1.092	1.068	1.074																	
2012	1.608	1.402	1.175	1.175	1.088	1.109																		
2013	3.828	1.585	1.391	1.080	1.118																			
2014	1.000	6.122	3.205	1.209																				
2015	4.922	1.606	1.295																					
2016	3.887	1.284																						
2017	5.527																							
VOL WTD 3	4.715	1.379	1.401	1.142	1.097	1.101	1.179	1.144	1.055	1.077	1.036	1.053	1.046	1.031	1.075	1.020	1.013	1.001	1.000	1.000	NA	NA	NA	NA
VOL WTD 5	4.495	1.426	1.231	1.134	1.138	1.113	1.126	1.080	1.051	1.051	1.061	1.045	1.046	1.028	1.052	1.040	1.012	1.001	1.000	1.000	NA	NA	NA	NA
VOL WTD ALL	2.715	1.324	1.276	1.132	1.104	1.067	1.063	1.077	1.092	1.052	1.112	1.037	1.037	1.028	1.050	1.040	1.012	1.001	1.000	1.000	NA	NA	NA	NA
ARITH 3	4.779	3.004	1.964	1.155	1.100	1.104	1.217	1.137	1.058	1.063	1.034	1.053	1.052	1.037	1.060	1.012	1.007	1.000	1.000	1.000	NA	NA	NA	NA
ARITH 5	3.833	2.400	1.630	1.133	1.216	1.161	1.097	1.055	1.048	1.070	1.044	1.050	1.030	1.036	1.032	1.005	1.000	1.000	1.000	1.000	NA	NA	NA	NA
ARITH ALL	5.100	1.672	1.468	1.140	1.112	1.080	1.089	1.079	1.380	1.154	1.176	1.050	1.040	1.037	1.030	1.032	1.005	1.000	1.000	1.000	NA	NA	NA	NA
5 YR HI LO	4.213	1.531	1.287	1.126	1.178	1.104	1.137	1.079	1.058	1.028	1.046	1.044	1.046	1.029	1.029	1.012	1.000	1.000	NA	NA	NA	NA	NA	NA
7 YR HI LO	3.514	1.481	1.497	1.125	1.144	1.083	1.115	1.073	1.064	1.037	1.070	1.035	1.032	1.031	1.022	1.012	1.000	1.000	NA	NA	NA	NA	NA	NA
ALL YR HI LO	4.706	1.450	1.389	1.136	1.119	1.072	1.075	1.073	1.088	1.051	1.087	1.041	1.038	1.031	1.022	1.012	1.000	1.000	NA	NA	NA	NA	NA	NA
SELECTED	2.715	1.324	1.231	1.126	1.104	1.067	1.063	1.077	1.058	1.051	1.061	1.037	1.037	1.028	1.029	1.020	1.016	1.013	1.010	1.008	1.006	1.005	1.004	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Paid Losses

RY	Development in Months																204	216	228	240	252	264	276	288
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192								
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	16,713	16,713	16,713	16,713	16,713	16,713	16,713	16,713	78,028	174,102	358,349	411,237	438,258	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042
1999	34,176	543,408	676,196	1,567,972	1,601,529	1,608,182	1,625,584	1,692,876	1,717,189	1,863,780	2,008,295	2,125,717	2,204,155	2,214,424	2,250,269	2,250,269	2,529,597	2,529,597	2,532,094	2,532,094	2,532,094	2,532,094	2,532,094	2,532,094
2000	370,129	651,957	822,756	850,390	862,198	877,375	971,906	999,462	1,037,135	1,123,070	1,139,298	1,154,165	1,182,661	1,184,428	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793
2001	1,334,769	2,056,418	2,236,336	2,404,395	2,628,060	2,759,085	2,817,023	2,896,871	3,183,541	3,519,996	3,623,500	4,589,112	4,674,733	4,876,595	5,018,242	5,488,608	5,638,087	5,757,861						
2002	25,391	271,845	573,933	704,799	818,350	881,841	924,693	1,047,264	1,187,136	1,386,044	1,436,815	1,464,223	1,479,159	1,556,347	1,638,304	1,677,022	1,692,921							
2003	55,198	182,491	265,162	413,872	493,384	585,783	665,773	694,461	783,706	823,855	878,721	1,047,401	1,100,227	1,145,541	1,200,282	1,276,743								
2004	154,438	481,188	709,451	889,323	1,154,237	1,550,136	1,738,876	1,795,147	1,978,584	2,219,493	2,316,258	2,443,349	2,565,442	2,616,804	2,645,562									
2005	76,161	890,444	1,013,676	1,114,425	1,203,629	1,266,271	1,326,703	1,350,155	1,385,185	1,396,276	1,407,470	1,431,885	1,477,651	1,616,331										
2006	60,491	272,313	423,641	682,375	875,535	1,035,779	1,072,081	1,190,682	1,221,925	1,334,084	1,534,980	1,631,669	1,755,125											
2007	107,082	353,965	564,316	635,862	852,470	936,817	967,505	1,018,844	1,069,756	1,108,422	1,126,553	1,150,527												
2008	76,453	189,175	241,331	325,929	380,673	391,046	417,098	458,918	516,229	541,900	554,141													
2009	6,274	65,671	122,193	236,292	251,768	366,562	459,776	569,158	696,182	758,059														
2010	25,118	101,329	119,772	202,531	218,274	289,061	327,938	439,479	466,760															
2011	105,665	351,316	535,992	579,582	651,347	711,550	759,749	815,994																
2012	492,662	792,235	1,110,684	1,305,178	1,533,202	1,668,186	1,849,816																	
2013	89,198	341,477	541,380	753,022	813,524	909,739																		
2014	3,119	3,119	19,091	61,186	74,003																			
2015	35,104	172,789	277,518	359,484																				
2016	145,829	566,906	727,719																					
2017	139,537	771,285																						
2018	153,788																							

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	478,042	478,042	478,042	-	-	-
1999	2,689,230	2,532,094	2,689,230	157,136	-	157,136
2000	1,195,793	1,195,793	1,195,793	-	-	-
2001	6,667,797	5,757,861	6,664,686	906,825	3,111	909,936
2002	2,386,183	1,692,921	2,382,845	689,924	3,338	693,262
2003	1,548,303	1,276,743	1,543,256	266,513	5,047	271,561
2004	2,865,372	2,645,562	2,845,405	199,843	19,967	219,810
2005	2,206,643	1,616,331	2,175,022	558,691	31,621	590,312
2006	2,154,225	1,755,125	2,138,100	382,976	16,124	399,100
2007	1,257,175	1,150,527	1,194,026	43,499	63,149	106,648
2008	609,737	554,141	580,153	26,011	29,584	55,595
2009	1,046,180	758,059	982,683	224,624	63,497	288,122
2010	739,771	466,760	725,760	259,000	14,012	273,012
2011	1,079,586	815,994	935,802	119,808	143,784	263,592
2012	2,868,213	1,849,816	2,451,291	601,475	416,922	1,018,396
2013	1,394,147	909,739	1,158,669	248,930	235,478	484,409
2014	1,016,535	74,003	817,642	743,639	198,893	942,532
2015	931,030	359,484	723,985	364,501	207,045	571,546
2016	1,796,378	727,719	1,407,791	680,072	388,586	1,068,658
2017	3,943,594	771,285	3,004,613	2,233,328	938,982	3,172,310
2018	3,018,130	153,788	1,743,650	1,589,862	1,274,480	2,864,342
TOTAL	41,892,064	27,541,785	37,838,443	10,296,657	4,053,621	14,350,279

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Development of Losses to Ultimate

RY	Development Period in Months																								
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT
1994																									1,000
1995																									1,000
1996																								1,000	1,000
1997																								1,000	1,000
1998	0.919	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5.060	1.000	1.000	1.000	0.941	0.860	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
1999	2.823	1.728	1.311	1.028	1.000	1.002	1.000	1.223	1.011	1.020	1.017	0.999	0.985	1.000	1.000	1.050	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2000	0.962	1.129	1.031	0.939	0.956	1.047	1.016	1.044	1.052	1.000	1.000	0.998	1.001	0.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2001	1.249	1.030	0.860	0.957	1.024	1.053	1.037	1.158	1.088	1.010	1.145	1.020	1.010	1.065	1.015	1.050	1.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2002	1.400	0.975	0.747	0.999	1.094	1.051	0.969	1.000	0.961	1.006	1.000	1.208	0.910	1.031	0.964	1.073	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2003	1.007	0.827	1.143	1.042	1.096	1.030	1.030	1.011	1.061	1.240	0.987	1.006	0.967	0.960	1.071	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2004	1.017	1.163	1.104	1.448	1.013	1.039	1.007	1.279	1.013	0.998	0.994	0.998	0.988	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2005	0.924	1.035	1.032	0.955	1.137	1.010	1.011	0.988	1.000	1.002	1.000	1.208	1.077	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2006	1.741	1.117	1.068	1.045	1.040	1.074	1.037	1.282	0.879	1.057	1.033	1.025	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2007	0.990	0.996	0.948	0.974	1.000	1.099	1.009	0.954	1.000	1.001	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2008	1.200	1.023	0.966	1.026	1.127	1.000	1.000	1.083	0.941	1.000	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2009	1.279	1.001	1.295	1.058	1.133	1.003	1.000	1.184	0.977	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2010	0.567	1.112	1.246	1.147	1.203	1.000	1.032	1.197	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2011	1.092	1.390	0.942	0.989	1.006	1.023	1.038	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2012	1.147	1.409	0.953	1.053	1.078	1.054	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2013	1.176	1.007	1.066	1.037	0.972	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2014	6.658	0.941	1.040	1.000	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2015	1.693	0.991	1.039	1.034	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2016	1.667	1.154	0.992	1.034	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2017	2.350	1.029	0.992	1.034	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000
2018	1.319	1.029	0.992	1.034	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1,000

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	127,001	116,714	116,714	116,714	116,714	116,714	116,714	116,714	116,714	590,611	590,611	590,611	590,611	555,611	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042
1999	308,314	870,343	1,504,209	1,971,983	2,027,001	2,026,436	2,030,044	2,030,044	2,482,580	2,510,580	2,561,027	2,603,820	2,601,196	2,561,795	2,561,795	2,561,795	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230
2000	1,026,004	986,880	1,114,568	1,148,569	1,078,568	1,030,942	1,079,607	1,097,363	1,145,515	1,205,440	1,205,440	1,205,440	1,202,646	1,203,928	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793
2001	3,289,000	4,108,645	4,233,509	3,642,391	3,484,058	3,566,802	3,756,792	3,895,867	4,511,171	4,910,015	4,958,003	5,677,351	5,790,979	5,849,503	6,227,944	6,318,643	6,632,090	6,664,686	6,667,797	6,667,797	6,667,797	6,667,797	6,667,797	6,667,797	6,667,797	6,667,797
2002	1,797,008	2,516,405	2,453,720	1,833,500	1,832,500	2,004,966	2,106,298	2,041,647	2,041,647	1,961,513	1,972,533	2,381,937	2,167,740	2,234,838	2,221,133	2,382,845	2,385,069	2,386,183	2,386,183	2,386,183	2,386,183	2,386,183	2,386,183	2,386,183	2,386,183	2,386,183
2003	1,020,098	1,027,589	849,418	970,556	1,011,191	1,108,245	1,141,783	1,175,610	1,188,633	1,261,406	1,563,735	1,542,848	1,552,847	1,501,010	1,441,010	1,543,256	1,546,138	1,547,581	1,548,303	1,548,303	1,548,303	1,548,303	1,548,303	1,548,303	1,548,303	1,548,303
2004	1,125,017	1,144,322	1,331,067	1,470,142	2,128,424	2,155,771	2,240,562	2,256,189	2,886,714	2,924,415	2,919,415	2,900,827	2,884,520	2,878,727	2,845,405	2,856,031	2,861,364	2,864,035	2,865,372	2,865,372	2,865,372	2,865,372	2,865,372	2,865,372	2,865,372	2,865,372
2005	1,543,485	1,425,516	1,475,649	1,522,726	1,454,148	1,653,994	1,671,234	1,688,897	1,668,486	1,668,486	1,672,486	1,672,486	2,019,809	2,175,022	2,191,267	2,199,450	2,203,556	2,205,614	2,206,643	2,206,643	2,206,643	2,206,643	2,206,643	2,206,643	2,206,643	2,206,643
2006	674,273	1,174,072	1,310,933	1,399,553	1,462,786	1,521,109	1,634,236	1,694,721	2,173,374	1,909,874	2,018,289	2,085,285	2,138,100	2,123,354	2,139,213	2,147,202	2,151,211	2,153,219	2,154,225	2,154,225	2,154,225	2,154,225	2,154,225	2,154,225	2,154,225	2,154,225
2007	1,238,240	1,225,463	1,220,733	1,156,901	1,127,089	1,127,090	1,238,935	1,250,577	1,249,903	1,192,870	1,192,870	1,194,026	1,247,765	1,239,160	1,248,415	1,253,077	1,255,417	1,256,589	1,257,175	1,257,175	1,257,175	1,257,175	1,257,175	1,257,175	1,257,175	1,257,175
2008	415,004	497,948	509,298	492,059	504,948	569,232	569,232	569,232	616,446	580,293	580,153	579,109	605,173	600,999	605,488	607,749	608,884	609,452	609,737	609,737	609,737	609,737	609,737	609,737	609,737	609,737
2009	426,280	545,273	545,773	706,544	747,814	847,182	849,952	849,952	1,006,233	982,683	995,420	993,629	1,038,350	1,031,188	1,038,890	1,042,770	1,044,717	1,045,692	1,046,180	1,046,180	1,046,180	1,046,180	1,046,180	1,046,180	1,046,180	1,046,180
2010	542,005	307,495	341,816	426,049	488,528	587,710	587,710	606,228	725,760	694,871	703,878	702,612	734,234	729,170	734,616	737,359	738,736	739,426	739,771	739,771	739,771	739,771	739,771	739,771	739,771	739,771
2011	620,289	677,051	941,165	886,346	881,631	901,895	935,802	1,059,138	1,014,061	1,027,206	1,025,357	1,071,505	1,064,116	1,072,063	1,076,067	1,077,076	1,079,082	1,079,586	1,079,586	1,079,586	1,079,586	1,079,586	1,079,586	1,079,586	1,079,586	1,079,586
2012	1,330,875	1,525,925	2,150,183	2,109,128	2,158,132	2,326,654	2,451,291	2,486,211	2,813,887	2,694,128	2,729,049	2,724,139	2,846,744	2,827,111	2,848,226	2,858,862	2,864,200	2,868,213	2,868,213	2,868,213	2,868,213	2,868,213	2,868,213	2,868,213	2,868,213	2,868,213
2013	1,010,000	1,070,292	1,077,876	1,049,154	1,104,154	1,158,669	1,191,495	1,208,469	1,367,742	1,309,530	1,326,504	1,324,138	1,382,712	1,374,169	1,384,432	1,389,602	1,393,497	1,394,147	1,394,147	1,394,147	1,394,147	1,394,147	1,394,147	1,394,147	1,394,147	1,394,147
2014	125,502	121,919	785,901	817,642	817,642	848,772	881,149	897,282	954,837	967,214	965,474	1,008,927	1,001,968	1,009,452	1,013,221	1,015,113	1,016,611	1,016,635	1,016,635	1,016,635	1,016,635	1,016,635	1,016,635	1,016,635	1,016,635	1,016,635
2015	415,143	737,696	796,796	795,877	795,877	795,877	795,877	795,877	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821	871,821
2016	732,004	1,819,643	1,780,971	1,396,984	1,444,902	1,492,961	1,557,128	1,557,128	1,762,354	1,687,347	1,709,219	1,706,144	1,782,932	1,770,635	1,783,860	1,790,522	1,793,865	1,795,540	1,796,378	1,796,378	1,796,378	1,796,378	1,796,378	1,796,378	1,796,378	1,796,378
2017	1,278,375	3,004,613	3,090,529	3,066,607	3,171,699	3,277,502	3,370,355	3,418,369	3,868,901	3,704,240	3,752,255	3,745,503	3,914,077	3,887,082	3,916,114	3,930,738	3,938,078	3,941,754	3,943,594	3,943,594	3,943,594	3,943,594	3,943,594	3,943,594	3,943,594	3,943,594
2018	1,743,650	2,299,504	2,365,529	2,346,950	2,427,609	2,508,353	2,579,416	2,616,162	2,960,965	2,834,946	2,871,693	2,865,526	2,995,540	2,974,880	2,997,099	3,008,291	3,013,908	3,014,722	3,018,130	3,018,130	3,018,130	3,018,130	3,018,130	3,018,130	3,018,130	3,018,130

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
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Selection of Loss Development Factors

RY	Development Period in Months																							
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300
1994	Excluded																							
1995																								
1996																								
1997																								
1998	0.919	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5.060	1.000	1.000	1.000	0.941	0.860	1.000	1.000	1.000	1.000	1.000	1.000				
1999	2.823	1.728	1.311	1.028	1.000	1.002	1.000	1.223	1.011	1.020	1.017	0.999	0.985	1.000	1.000	1.050	1.000	1.000	1.000	1.000				
2000	0.962	1.129	1.031	0.939	0.956	1.047	1.016	1.044	1.052	1.000	1.000	0.998	1.001	0.993	1.000	1.000	1.000	1.000	1.000					
2001	1.249	1.030	0.860	0.957	1.024	1.053	1.037	1.158	1.088	1.010	1.145	1.020	1.010	1.065	1.015	1.050	1.005							
2002	1.400	0.975	0.747	0.999	1.094	1.051	0.969	1.000	0.961	1.006	1.000	1.208	0.910	1.031	0.994	1.073								
2003	1.007	0.827	1.143	1.042	1.096	1.030	1.030	1.011	1.061	1.240	0.987	1.006	0.967	0.960	1.071									
2004	1.017	1.163	1.104	1.448	1.013	1.039	1.007	1.279	1.013	0.998	0.994	0.994	0.998	0.988										
2005	0.924	1.035	1.032	0.955	1.137	1.010	1.011	0.988	1.000	1.002	1.000	1.208	1.077											
2006	1.741	1.117	1.068	1.045	1.040	1.074	1.037	1.282	0.879	1.057	1.033	1.025												
2007	0.990	0.996	0.948	0.974	1.000	1.099	1.009	0.999	0.954	1.000	1.001													
2008	1.200	1.023	0.966	1.026	1.127	1.000	1.000	1.083	0.941	1.000														
2009	1.279	1.001	1.295	1.058	1.133	1.003	1.000	1.184	0.977															
2010	0.567	1.112	1.246	1.147	1.203	1.000	1.032	1.197																
2011	1.092	1.390	0.942	0.989	1.006	1.023	1.038																	
2012	1.147	1.409	0.953	1.053	1.078	1.054																		
2013	1.176	1.007	1.066	1.037	0.972																			
2014	6.658	0.941	1.040	1.000																				
2015	1.693	0.991	1.039																					
2016	1.667	1.154																						
2017	2.350																							
VOL WTD 3	2.032	1.048	1.051	1.038	1.033	1.038	1.022	1.159	0.959	1.029	1.014	1.058	1.015	0.996	1.018	1.049	1.003	1.000	1.000	1.000	NA	NA	NA	NA
VOL WTD 5	1.974	1.143	0.995	1.038	1.062	1.028	1.015	1.161	0.943	1.013	1.003	1.079	0.996	1.025	1.013	1.047	1.003	1.000	1.000	1.000	NA	NA	NA	NA
VOL WTD ALL	1.319	1.095	0.992	1.034	1.046	1.040	1.014	1.132	1.029	1.025	1.038	1.045	0.993	1.016	1.013	1.047	1.003	1.000	1.000	1.000	NA	NA	NA	NA
ARITH 3	1.903	1.029	1.049	1.030	1.019	1.026	1.023	1.155	0.957	1.019	1.011	1.076	1.014	0.993	1.026	1.041	1.002	1.000	1.000	1.000	NA	NA	NA	NA
ARITH 5	2.709	1.100	1.008	1.045	1.078	1.016	1.016	1.149	0.950	1.011	1.003	1.088	0.992	1.007	1.016	1.034	1.001	1.000	1.000	1.000	NA	NA	NA	NA
ARITH ALL	1.593	1.107	1.044	1.041	1.055	1.032	1.013	1.111	1.333	1.030	1.018	1.051	0.986	0.985	1.013	1.034	1.001	1.000	1.000	1.000	NA	NA	NA	NA
5 YR HI LO	1.903	1.051	1.011	1.030	1.072	1.009	1.014	1.155	0.957	1.001	0.998	1.080	0.992	1.004	1.005	1.033	1.000	1.000	NA	NA	NA	NA	NA	NA
7 YR HI LO	1.607	1.131	1.069	1.035	1.069	1.031	1.018	1.149	0.977	1.013	1.006	1.051	0.992	0.995	1.004	1.033	1.000	1.000	NA	NA	NA	NA	NA	NA
ALL YR HI LO	1.369	1.087	1.046	1.021	1.051	1.030	1.015	1.107	1.006	1.010	1.006	1.037	0.984	0.995	1.004	1.033	1.000	1.000	NA	NA	NA	NA	NA	NA
SELECTED	1.319	1.029	0.992	1.034	1.033	1.028	1.014	1.132	0.957	1.013	0.998	1.045	0.993	1.007	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Incurred Losses

RY	Development in Months																252	264	276	288
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	127,001	116,714	116,714	116,714	116,714	116,714	116,714	116,714	116,714	590,611	590,611	590,611	590,611	555,611	478,042	478,042	478,042	478,042	478,042	478,042
1999	308,314	870,343	1,504,209	1,971,983	2,027,001	2,026,436	2,030,044	2,030,044	2,482,580	2,510,580	2,561,027	2,603,820	2,601,196	2,561,795	2,561,795	2,561,795	2,689,230	2,689,230	2,689,230	2,689,230
2000	1,026,004	986,880	1,114,568	1,148,569	1,078,568	1,030,942	1,079,607	1,097,363	1,145,515	1,205,440	1,205,440	1,205,440	1,202,646	1,203,928	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793
2001	3,289,000	4,108,645	4,233,509	3,642,391	3,484,058	3,566,802	3,756,792	3,895,867	4,511,171	4,910,015	4,958,003	5,677,351	5,790,979	5,849,503	6,227,944	6,318,643	6,632,090	6,664,686		
2002	1,797,008	2,516,405	2,453,720	1,833,500	1,832,500	2,004,966	2,106,298	2,041,647	2,041,647	1,961,513	1,972,533	1,972,533	2,381,937	2,167,740	2,234,838	2,221,133	2,382,845			
2003	1,020,098	1,027,589	849,418	970,556	1,011,191	1,108,245	1,141,783	1,175,610	1,188,633	1,261,406	1,563,735	1,542,848	1,552,847	1,501,010	1,441,010	1,543,256				
2004	1,125,017	1,144,322	1,331,067	1,470,142	2,128,424	2,155,771	2,240,562	2,256,189	2,886,714	2,924,415	2,919,415	2,900,827	2,884,520	2,878,727	2,845,405					
2005	1,543,485	1,425,516	1,475,649	1,522,726	1,454,148	1,653,994	1,671,234	1,688,897	1,668,486	1,668,486	1,672,486	1,672,486	2,019,809	2,175,022						
2006	674,273	1,174,072	1,310,933	1,399,553	1,462,786	1,521,109	1,634,236	1,694,721	2,173,374	1,909,874	2,018,289	2,085,285	2,138,100							
2007	1,238,240	1,225,463	1,220,733	1,156,901	1,127,089	1,127,090	1,238,935	1,250,577	1,249,903	1,192,870	1,192,870	1,194,026								
2008	415,004	497,948	509,298	492,059	504,948	569,232	569,232	569,232	616,446	580,293	580,153									
2009	426,280	545,273	545,773	706,544	747,814	847,182	849,952	849,952	1,006,233	982,683										
2010	542,005	307,495	341,816	426,049	488,528	587,710	587,710	606,228	725,760											
2011	620,289	677,051	941,165	886,346	876,176	881,631	901,895	935,802												
2012	1,330,875	1,525,925	2,150,183	2,049,128	2,158,132	2,326,654	2,451,291													
2013	910,009	1,070,292	1,077,876	1,149,154	1,192,073	1,158,669														
2014	125,502	835,619	785,906	817,642																
2015	415,143	702,914	696,796	723,985																
2016	732,004	1,219,943	1,407,791																	
2017	1,278,375	3,004,613																		
2018	1,743,650																			

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM ULTIMATE</u>	<u>INC LDM ULTIMATE</u>	<u>SELECTED ULTIMATE</u>	<u>POLICIES IN FORCE</u>	<u>PURE PREMIUM</u>
2008	752,679	609,737	681,208	517	1,318
2009	1,082,577	1,046,180	1,064,378	563	1,891
2010	725,760	739,771	732,765	578	1,268
2011	1,328,055	1,079,586	1,203,821	810	1,486
2012	3,201,767	2,868,213	3,034,990	975	3,113
2013	1,679,661	1,394,147	1,536,904	1,003	1,532
2014	817,642	1,016,535	917,089	1,030	890
2015	825,614	931,030	878,322	1,021	860
2016	2,057,290	1,796,378	1,926,834	1,010	1,908
2017	3,004,613	3,943,594	3,474,103	1,005	3,457
2018	1,743,650	3,018,130	2,380,890	999	2,383
TOTAL	17,219,307	18,443,301	17,831,304	9,511	1,875

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	517	1,318	1,771	1,618	836,649	26.4%	220,687	554,141	774,828	580,153	194,675	26,011	1,499
2009	563	1,891	2,467	1,667	938,423	30.0%	281,306	758,059	1,039,364	982,683	56,682	224,624	1,846
2010	578	1,268	1,606	1,717	992,328	33.8%	335,713	466,760	802,473	725,760	76,713	259,000	1,388
2011	810	1,486	1,828	1,768	1,432,352	38.6%	552,275	815,994	1,368,269	935,802	432,467	119,808	1,689
2012	975	3,113	3,717	1,821	1,775,851	42.2%	749,855	1,849,816	2,599,672	2,451,291	148,381	601,475	2,666
2013	1,003	1,532	1,776	1,876	1,881,655	45.8%	862,512	909,739	1,772,251	1,158,669	613,582	248,930	1,767
2014	1,030	890	1,002	1,932	1,990,277	51.0%	1,014,240	74,003	1,088,243	817,642	270,601	743,639	1,057
2015	1,021	860	940	1,990	2,032,073	56.5%	1,147,280	359,484	1,506,764	723,985	782,779	364,501	1,476
2016	1,010	1,908	2,024	2,050	2,070,485	64.6%	1,338,098	727,719	2,065,817	1,407,791	658,026	680,072	2,045
2017	1,005	3,457	3,561	2,111	2,122,042	73.3%	1,555,227	771,285	2,326,512	3,004,613	(678,101)	2,233,328	2,315
2018	999	2,383	2,383	2,175	2,172,654	90.2%	1,958,902	153,788	2,112,690	1,743,650	369,040	1,589,862	2,115
TOTAL	9,511				18,244,788		10,016,096	7,440,787	17,456,884	14,532,038	2,924,846	7,091,251	1,835
	<u>Pure Premium Selection</u>				Trend =	1.030							
	3-Year Average x Latest		2,175										
	5-Year Average x Latest		1,861										
	All Year Average x Latest		2,069										
	Selected Pure Premium		2,175										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Insurance AST
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	517	1,318	1,771	1,618	836,649	4.9%	40,593	580,153	620,746	554,141	66,605	26,011	1,201
2009	563	1,891	2,467	1,667	938,423	6.1%	56,957	982,683	1,039,640	758,059	281,581	224,624	1,847
2010	578	1,268	1,606	1,717	992,328	1.9%	18,795	725,760	744,555	466,760	277,795	259,000	1,288
2011	810	1,486	1,828	1,768	1,432,352	13.3%	190,767	935,802	1,126,569	815,994	310,575	119,808	1,391
2012	975	3,113	3,717	1,821	1,775,851	14.5%	258,137	2,451,291	2,709,427	1,849,816	859,611	601,475	2,779
2013	1,003	1,532	1,776	1,876	1,881,655	16.9%	317,821	1,158,669	1,476,490	909,739	566,751	248,930	1,472
2014	1,030	890	1,002	1,932	1,990,277	19.6%	389,413	817,642	1,207,055	74,003	1,133,052	743,639	1,172
2015	1,021	860	940	1,990	2,032,073	22.2%	451,898	723,985	1,175,883	359,484	816,399	364,501	1,152
2016	1,010	1,908	2,024	2,050	2,070,485	21.6%	447,880	1,407,791	1,855,672	727,719	1,127,952	680,072	1,837
2017	1,005	3,457	3,561	2,111	2,122,042	23.8%	505,265	3,004,613	3,509,877	771,285	2,738,593	2,233,328	3,492
2018	999	2,383	2,383	2,175	2,172,654	42.2%	917,457	1,743,650	2,661,107	153,788	2,507,319	1,589,862	2,664
TOTAL	9,511				18,244,788		3,594,983	14,532,038	18,127,021	7,440,787	10,686,234	7,091,251	1,906
	<u>Pure Premium Selection</u>				Trend =	1.030							
	3-Year Average x Latest		2,175										
	5-Year Average x Latest		1,861										
	All Year Average x Latest		2,069										
	Selected Pure Premium		2,175										

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	PAID LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	106,826	106,826	106,826	-	-	-
1996	109,456	109,456	109,456	-	-	-
1997	-	-	-	-	-	-
1998	662,586	635,092	635,093	1	27,493	27,494
1999	1,500,783	1,390,883	1,500,783	109,899	-	109,899
2000	5,376,624	3,920,130	5,376,624	1,456,494	-	1,456,494
2001	1,621,524	1,166,740	1,621,524	454,784	-	454,784
2002	239,493	239,493	239,493	-	-	-
2003	582,435	501,430	552,376	50,946	30,059	81,005
2004	2,060,194	1,703,105	1,859,341	156,236	200,853	357,089
2005	79,838	79,838	79,838	-	-	-
2006	-	-	-	-	-	-
2007	41,750	41,750	41,750	-	-	-
2008	51,787	51,787	51,787	-	-	-
2009	268,109	163,657	179,722	16,065	88,388	104,453
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	481,642	142,401	195,789	53,388	285,852	339,240
2016	-	-	-	-	-	-
2017	325,861	53,255	65,680	12,425	260,182	272,606
2018	-	-	-	-	-	-
TOTAL	13,508,906	10,305,842	12,616,079	2,310,237	892,827	3,203,064

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Development of Losses to Ultimate

RY	Development Period in Months																									
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - ULT	
1994																										1.033
1995							2.144	1.250	1.102	1.016	1.278	1.153	1.000	1.048	1.141	1.010	1.042	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.033
1996								1.967	1.516	1.030	1.000	1.000	1.000	1.048	1.141	1.057	1.109	1.113	1.009	1.011	1.055	1.000	1.001	1.000	1.000	1.033
1997																										1.033
1998		2.879	1.306	1.090	1.020	1.000	1.056	1.070	1.037	1.019	1.055	1.046	1.006	1.009	1.000	1.000	1.000	1.000	1.000	1.000	1.006	1.002	1.001	1.000	1.000	1.033
1999	1.701	2.649	1.129	1.235	1.136	1.319	1.105	1.061	1.055	1.049	1.055	1.024	1.016	1.002	1.007	1.007	1.035	1.032	1.041	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2000	1.962	1.171	1.107	1.048	1.046	1.070	1.068	1.150	1.105	1.047	1.036	1.019	1.040	1.028	1.016	1.035	1.216	1.066	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2001			7.454	2.945	2.045	1.350	1.237	1.305	1.137	1.164	1.109	1.073	1.141	1.052	1.205	1.093	1.118	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2002		4.517	2.551	1.068	1.086	1.000	1.038	1.904	1.113	1.019	1.000	1.065	1.000	1.000	1.000	1.000	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2003	1.224	1.255	1.000	1.000	1.000	1.317	1.736	1.067	1.029	1.286	1.111	1.054	1.071	1.053	1.010	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2004		3.475	1.113	1.759	1.221	1.157	1.322	1.092	1.254	1.712	1.027	1.055	1.028	1.066	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2005	1.794	1.493	1.622	1.000	1.316	1.173	1.202	1.079	1.000	1.000	1.000	1.000	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.000	1.033
2006												1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.000	1.033
2007		2.517	1.169	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2008		1.226	1.100	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2009			1.105	1.340	1.052	1.375	1.089	1.347	1.098	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2010									1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2011								1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2012							1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2013						1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2014					1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2015		2.167	1.222	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2016			1.168	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2017	1.233	1.548	1.168	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
2018	1.824	1.548	1.168	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000	1.000	1.033
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	19,195	41,156	51,445	56,701	57,626	73,664	84,921	84,921	88,971	101,542	102,511	106,826	106,826	106,826	106,826	106,826	106,826	106,826	110,389
1996	-	-	-	-	-	-	-	-	-	-	14,203	27,940	42,359	43,615	43,615	48,148	77,977	82,406	91,416	101,779	102,681	103,782	109,456	109,564	109,564	113,219
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	113,506	326,771	426,734	465,016	474,091	474,091	500,870	536,142	555,872	566,448	597,852	625,365	629,257	635,092	635,092	635,092	635,092	635,092	635,092	635,092	638,995	640,566	641,196	641,196	662,586
1999	91,601	155,804	412,759	466,204	575,644	653,770	862,519	953,244	1,011,272	1,067,094	1,119,362	1,181,084	1,209,850	1,229,249	1,232,121	1,241,346	1,250,602	1,294,320	1,335,943	1,390,883	1,405,132	1,413,769	1,417,245	1,418,638	1,418,638	1,465,963
2000	600,543	1,178,120	1,380,065	1,527,820	1,601,730	1,675,915	1,792,516	1,914,991	2,202,232	2,433,794	2,547,274	2,638,146	2,687,862	2,795,225	2,873,605	2,920,207	3,022,541	3,675,996	3,920,130	3,987,062	4,027,907	4,052,665	4,062,629	4,066,624	4,066,624	4,202,283
2001	-	-	4,285	31,943	94,057	192,393	259,731	321,220	419,351	476,821	555,214	615,741	660,726	753,773	792,848	955,109	1,043,903	1,166,740	1,191,641	1,211,987	1,224,403	1,231,929	1,234,958	1,236,172	1,236,172	1,277,410
2002	-	7,498	33,870	86,415	92,333	100,309	100,309	104,163	198,304	220,667	224,817	224,817	239,493	239,493	239,493	239,493	245,882	251,130	255,418	258,034	259,620	260,259	260,514	260,514	269,205	
2003	75,879	92,879	116,529	116,529	116,529	116,529	153,490	266,468	284,207	292,415	376,033	417,688	440,376	471,503	496,493	501,430	518,151	531,975	543,328	552,605	558,266	561,698	563,079	563,632	582,435	
2004	-	48,087	167,082	185,942	327,157	399,428	462,288	611,344	667,682	837,489	1,433,954	1,473,129	1,554,162	1,598,045	1,703,105	1,773,663	1,832,811	1,881,706	1,921,867	1,954,681	1,974,705	1,986,843	1,991,728	1,993,686	1,993,686	2,060,194
2005	9,181	16,467	24,588	39,884	39,884	52,485	61,585	74,021	79,838	79,838	79,838	79,838	79,838	79,838	82,532	85,952	88,818	91,187	93,134	94,724	95,694	96,282	96,519	96,614	99,837	
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	14,192	35,720	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	43,353	45,051	46,571	48,501	50,118	51,455	52,553	53,450	53,998	54,330	54,464	54,517	54,517	56,336
2008	-	38,408	47,087	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	54,408	56,496	58,709	60,691	63,205	65,313	67,055	68,486	69,656	70,369	70,802	70,976	71,046	73,416
2009	-	-	47,443	52,422	70,244	73,919	101,655	110,661	149,107	163,657	189,122	198,694	206,320	214,402	221,639	230,821	238,518	244,881	250,108	254,378	256,984	258,564	259,199	259,454	259,454	268,109
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	-	53,789	116,564	142,401	163,507	180,263	205,162	233,765	266,614	293,999	339,747	356,942	370,642	385,159	398,160	414,655	428,483									

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Selection of Loss Development Factors

RY	Development Period in Months																							
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300
1994												Excluded												
1995							2.144	1.250	1.102	1.016	1.278	1.153	1.000	1.048	1.141	1.010	1.042	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996										1.967	1.516	1.030	1.000	1.104	1.620	1.057	1.109	1.113	1.009	1.011	1.055	1.000		
1997																								
1998		2.879	1.306	1.090	1.020	1.000	1.056	1.070	1.037	1.019	1.055	1.046	1.006	1.009	1.000	1.000	1.000	1.000	1.000	1.000				
1999	1.701	2.649	1.129	1.235	1.136	1.319	1.105	1.061	1.055	1.049	1.055	1.024	1.016	1.002	1.007	1.007	1.035	1.032	1.041					
2000	1.962	1.171	1.107	1.048	1.046	1.070	1.068	1.150	1.105	1.047	1.036	1.019	1.040	1.028	1.016	1.035	1.216	1.066						
2001			7.454	2.945	2.045	1.350	1.237	1.305	1.137	1.164	1.109	1.073	1.141	1.052	1.205	1.093	1.118							
2002		4.517	2.551	1.068	1.086	1.000	1.038	1.904	1.113	1.019	1.000	1.065	1.000	1.000	1.000	1.000								
2003	1.224	1.255	1.000	1.000	1.000	1.317	1.736	1.067	1.029	1.286	1.111	1.054	1.071	1.053	1.010									
2004		3.475	1.113	1.759	1.221	1.157	1.322	1.092	1.254	1.712	1.027	1.055	1.028	1.066										
2005	1.794	1.493	1.622	1.000	1.316	1.173	1.202	1.079	1.000	1.000	1.000	1.000	1.000											
2006																								
2007		2.517	1.169	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000													
2008		1.226	1.100	1.000	1.000	1.000	1.000	1.000	1.000	1.000														
2009			1.105	1.340	1.052	1.375	1.089	1.347	1.098															
2010																								
2011																								
2012																								
2013																								
2014																								
2015		2.167	1.222																					
2016																								
2017	1.233																							
VOL WTD 3	2.479	2.167	1.222	NA	NA	NA	1.089	1.237	1.060	1.000	1.000	1.052	1.036	1.056	1.109	1.046	1.154	1.051	1.028	1.001	1.027	1.000	1.000	NA
VOL WTD 5	2.479	2.167	1.222	NA	1.052	1.221	1.046	1.188	1.045	1.590	1.042	1.054	1.056	1.042	1.040	1.033	1.138	1.052	1.026	1.001	1.027	1.000	1.000	NA
VOL WTD ALL	1.824	1.548	1.168	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.136	1.051	1.026	1.001	1.027	1.000	1.000	NA
ARITH 3	1.233	2.167	1.222	NA	NA	NA	1.089	1.174	1.033	1.000	1.000	1.028	1.033	1.040	1.072	1.043	1.123	1.033	1.021	1.005	1.027	1.000	1.000	NA
ARITH 5	1.233	2.167	1.222	NA	1.052	1.188	1.030	1.116	1.024	1.178	1.035	1.044	1.048	1.040	1.048	1.027	1.092	1.053	1.012	1.004	1.027	1.000	1.000	NA
ARITH ALL	1.583	2.335	1.823	1.317	1.175	1.160	1.250	1.194	1.077	1.190	1.108	1.052	1.030	1.040	1.125	1.029	1.087	1.042	1.012	1.004	1.027	1.000	1.000	NA
5 YR HI LO	NA	NA	NA	NA	NA	NA	1.000	1.000	1.000	1.000	1.014	1.055	1.033	1.044	1.011	1.014	1.076	1.049	1.004	1.000	NA	NA	NA	NA
7 YR HI LO	NA	NA	NA	NA	1.000	1.000	1.044	1.057	1.032	1.076	1.034	1.048	1.031	1.029	1.008	1.025	1.076	1.033	1.004	1.000	NA	NA	NA	NA
ALL YR HI LO	1.576	2.208	1.342	1.171	1.097	1.154	1.185	1.142	1.068	1.131	1.075	1.046	1.020	1.037	1.063	1.022	1.076	1.033	1.004	1.000	NA	NA	NA	NA
SELECTED	1.824	1.548	1.168	1.148	1.102	1.138	1.139	1.141	1.103	1.156	1.051	1.038	1.039	1.034	1.041	1.033	1.027	1.021	1.017	1.010	1.006	1.002	1.001	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Paid Losses

RY	Development in Months																			
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	19,195	41,156	51,445	56,701	57,626	73,664	84,921	84,921	88,971	101,542	102,511	106,826	106,826	106,826
1996	-	-	-	-	-	-	-	-	-	14,203	27,940	42,359	43,615	43,615	48,148	77,977	82,406	91,416	101,779	102,681
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	113,506	326,771	426,734	465,016	474,091	474,091	500,870	536,142	555,872	566,448	597,852	625,365	629,257	635,092	635,092	635,092	635,092	635,092	635,092
1999	91,601	155,804	412,759	466,204	575,644	653,770	862,519	953,244	1,011,272	1,067,094	1,119,362	1,181,084	1,209,850	1,229,249	1,232,121	1,241,346	1,250,602	1,294,320	1,335,943	1,390,883
2000	600,543	1,178,120	1,380,065	1,527,820	1,601,730	1,675,915	1,792,516	1,914,991	2,202,232	2,433,794	2,547,274	2,638,146	2,687,862	2,795,225	2,873,605	2,920,207	3,022,541	3,675,996	3,920,130	-
2001	-	-	4,285	31,943	94,057	192,393	259,731	321,220	419,351	476,821	555,214	615,741	660,726	753,773	792,848	955,109	1,043,903	1,166,740	-	-
2002	-	7,498	33,870	86,415	92,333	100,309	100,309	104,163	198,304	220,667	224,817	224,817	239,493	239,493	239,493	239,493	239,493	-	-	-
2003	75,879	92,879	116,529	116,529	116,529	116,529	153,490	266,468	284,207	292,415	376,033	417,688	440,376	471,503	496,493	501,430	-	-	-	-
2004	-	48,087	167,082	185,942	327,157	399,428	462,288	611,344	667,682	837,489	1,433,954	1,473,129	1,554,162	1,598,045	1,703,105	-	-	-	-	-
2005	9,181	16,467	24,588	39,884	39,884	52,485	61,585	74,021	79,838	79,838	79,838	79,838	79,838	79,838	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	14,192	35,720	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	-	-	-	-	-	-
2008	-	38,408	47,087	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	-	-	-	-	-	-	-	-
2009	-	-	47,443	52,422	70,244	73,919	101,655	110,661	149,107	163,657	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	-	53,789	116,564	142,401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2017	43,180	53,255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	-	-	-	-	-	-
1995	106,826	106,826	106,826	-	-	-
1996	109,456	109,456	109,456	-	-	-
1997	-	-	-	-	-	-
1998	635,093	635,092	635,093	1	-	1
1999	1,500,783	1,390,883	1,500,783	109,899	-	109,899
2000	5,376,624	3,920,130	5,376,624	1,456,494	-	1,456,494
2001	1,621,524	1,166,740	1,621,524	454,784	-	454,784
2002	239,493	239,493	239,493	-	-	-
2003	552,376	501,430	552,376	50,946	-	50,946
2004	2,053,795	1,703,105	1,859,341	156,236	194,454	350,689
2005	90,100	79,838	79,838	-	10,262	10,262
2006	-	-	-	-	-	-
2007	51,726	41,750	41,750	-	9,976	9,976
2008	66,060	51,787	51,787	-	14,274	14,274
2009	258,423	163,657	179,722	16,065	78,701	94,766
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	328,150	142,401	195,789	53,388	132,361	185,748
2016	-	-	-	-	-	-
2017	128,301	53,255	65,680	12,425	62,622	75,046
2018	-	-	-	-	-	-
TOTAL	13,118,729	10,305,842	12,616,079	2,310,237	502,649	2,812,886

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Development of Losses to Ultimate

RY	Development Period in Months																											
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	300-ULT			
1994																										1,000		
1995	1,000	NA	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,067	1,000	1,000	805	1,291	1,096	885	894	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
1996	0.231	1,000	1,000	2,333	2,000	1,000	0.286		1,000	1,079	1,260	1,000	1,000	1,000	1,505	1,058	1,000	1,108	1,000	1,000	0.913		1,000	1,000	1,000	1,000		
1997																										1,000		
1998	1,062	2,451	1,173	0.998	1,460	1,000	0.738	0.814	0.872	1,015	1,047	0.920	1,000	0.988	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
1999	2,490	0.658	1,022	1.103	1,251	0.943	1,026	1,041	1,044	0.966	1,024	1,015	1,000	0.964	1,015	1,000	1,023	1,012	1,055	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2000	1,181	1,060	1,072	1,020	0.993	1,022	1,108	1,020	1,244	1,054	0.991	1,172	0.992	0.996	1,049	1,007	1,043	0.983	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2001	3,476	1,429	1,067	0.918	1,072	0.955	1,072	1,081	1,081	0.972	1,022	1,000	1,000	1,000	1,137	0.987	0.980	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2002	3,261	0.902	0.742	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0.549	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2003	1,004	1,185	1,031	1,000	1,114	1,298	1,128	0.958	1,150	1,051	1,000	0.832	1,147	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2004	0.860	3,207	0.981	1,000	0.999	1,000	1,211	0.977	1,540	1,042	1,031	1,043	1,000	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2005	0.922	0.888	1,000	0.974	1,119	1,000	1,367	0.872	1,000	1,000	1,000	1,000	1,000	1,000	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2006															1,000	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2007	0.860	1,000	0.485	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2008	0.577	1,000	0.898	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2009	1,000	2,119	1,000	1,000	1,000	1,346	1,260	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2010										1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2011										1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2012							1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2013						1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2014					1,079	1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2015	NA	1,000	1,000	1,017	1,079	1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2016			1,000	1,017	1,079	1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2017	1,314	1,166	1,000	1,017	1,079	1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
2018	1,521	1,166	1,000	1,017	1,079	1,022	1,040	1,000	1,000	1,127	1,030	1,065	1,031	1,022	1,105	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300			
1994																												
1995	1	1	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	106,701	106,701	106,701	85,921	110,921	121,542	107,511	106,826	106,826	106,826	106,826	106,826	106,826	106,826	106,826	106,826		
1996	65,000	15,001	15,001	15,001	35,001	70,001	70,001	20,000		50,001	53,940	67,940	67,940	67,940	67,940	102,248	108,206	108,206	119,916	119,916	119,916	109,456	109,456	109,456	109,456			
1997																												
1998	282,000	299,445	733,820	861,104	859,104	1,254,635	1,254,635	925,870	753,994	657,142	667,199	698,719	642,886	642,886	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092			
1999	576,051	1,434,131	943,131	963,453	1,062,740	1,329,280	1,254,083	1,286,407	1,338,653	1,397,656	1,350,524	1,383,455	1,403,917	1,403,917	1,353,916	1,373,691	1,373,691	1,422,494	1,500,783	1,500,783	1,500,783	1,500,783	1,500,783	1,500,783	1,500,783			
2000	2,102,117	2,481,718	2,630,090	2,819,602	2,876,382	2,857,665	2,921,118	3,236,350	3,301,716	4,107,206	4,330,459	4,291,056	5,028,325	4,988,325	4,966,651	5,210,072	5,471,619	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624			
2001	302,096	1,050,043	1,500,023	1,219,931	1,178,913	1,082,184	1,141,921	1,313,922	1,243,082	1,344,127	1,522,137	1,480,155	1,503,301	1,515,771	1,415,769	1,659,746	1,638,565	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524			
2002	200,004	652,311	588,414	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415			
2003	250,003	250,882	297,387	306,532	306,532	341,531	443,402	500,006	478,961	550,916	578,916	481,483	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376			
2004	300,004	258,090	827,611	812,287	812,287	811,862	811,862	983,570	961,290	1,480,232	1,690,604	1,743,171	1,818,773	1,818,773	1,859,341	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795	2,053,795			
2005	75,000	69,181	61,467	61,467	59,884	66,985	66,985	91,585	79,838	79,838	79,838	79,838	79,838	79,838	81,569	90,100	90,100	90,100	90,100	90,100	90,100	90,100	90,100	90,100	90,100			
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2007	100,001	86,012	86,012	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	44,452	45,835	46,829	51,726	51,726	51,726	51,726	51,726	51,726	51,726	51,726	51,726	51,726			
2008	100,000	57,687	57,687	51,787	51,787	51,787	51,787	51,787	51,787	51,787	53,320	56,770	56,770	58,536	59,806	66,060	66,060	66,060	66,060	66,060	66,060	66,060	66,060	66,060	66,060			
2009	50,001	50,001	105,943	105,943	105,943	105,943	142,619	179,761	179,761	179,722	202,586	208,582	222,080	228,989	233,955	258,423	258,423	258,423	258,423	258,423	258,423	258,423	258,423	258,423	258,423			
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2015	1	195,789	195,789	195,789	199,109	214,765	219,451	228,213	228,213	228,213	257,247	264,861	282,001	290,773	297,080	328,150	328,150	328,150	328,150	328,150	328,150	328,150	328,150	328,150	328,150			
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
20																												

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Selection of Loss Development Factors

RY	Development Period in Months																							
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300
1994												Excluded												
1995	1.000	NA	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.067	1.000	1.000	0.805	1.291	1.096	0.885	0.994	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	0.231	1.000	1.000	2.333	2.000	1.000	0.286			1.079	1.260	1.000	1.000	1.000	1.505	1.058	1.000	1.108	1.000	1.000	0.913	1.000		
1997																								
1998	1.062	2.451	1.173	0.998	1.460	1.000	0.738	0.814	0.872	1.015	1.047	0.920	1.000	0.988	1.000	1.000	1.000	1.000	1.000	1.000				
1999	2.490	0.658	1.022	1.103	1.251	0.943	1.026	1.041	1.044	0.966	1.024	1.015	1.000	0.964	1.015	1.000	1.023	1.012	1.055					
2000	1.181	1.060	1.072	1.020	0.993	1.022	1.108	1.020	1.244	1.054	0.991	1.172	0.992	0.996	1.049	1.007	1.043	0.983						
2001	3.476	1.429	0.813	0.967	0.918	1.055	1.079	1.009	1.081	1.132	0.972	1.016	1.008	0.934	1.172	0.987	0.990							
2002	3.261	0.902	0.742	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.549								
2003	1.004	1.185	1.031	1.000	1.114	1.298	1.128	0.958	1.150	1.051	1.000	0.832	1.147	1.000	1.000									
2004	0.860	3.207	0.981	1.000	0.999	1.000	1.211	0.977	1.540	1.142	1.031	1.043	1.000	1.022										
2005	0.922	0.888	1.000	0.974	1.119	1.000	1.367	0.872	1.000	1.000	1.000	1.000	1.000											
2006																								
2007	0.860	1.000	0.485	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000													
2008	0.577	1.000	0.898	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000													
2009	1.000	2.119	1.000	1.000	1.000	1.346	1.260	1.000	1.000															
2010																								
2011																								
2012																								
2013																								
2014																								
2015	NA	1.000	1.000																					
2016																								
2017	1.314																							
VOL WTD 3	NA	NA	1.000	NA	NA	NA	1.260	1.000	1.000	1.000	1.000	1.041	1.030	1.014	1.101	0.975	1.029	0.990	1.038	1.000	0.954	1.000	1.000	NA
VOL WTD 5	NA	NA	1.000	NA	1.000	1.233	1.157	1.000	1.000	1.127	1.022	0.992	1.019	0.991	1.058	0.981	1.027	0.991	1.034	1.000	0.954	1.000	1.000	NA
VOL WTD ALL	1.521	1.166	0.981	1.017	1.079	1.022	1.040	0.989	1.163	1.060	1.005	1.065	1.002	0.990	1.058	0.980	1.026	0.991	1.034	1.000	0.954	1.000	1.000	NA
ARITH 3	1.314	1.000	1.000	NA	NA	NA	1.260	1.000	1.000	1.000	1.000	1.022	1.049	1.007	1.057	0.848	1.019	0.998	1.028	1.000	0.956	1.000	1.000	NA
ARITH 5	1.314	1.000	1.000	NA	1.000	1.173	1.087	1.000	1.000	1.036	1.008	0.969	1.031	0.990	1.047	0.909	1.014	1.026	1.014	1.000	0.956	1.000	1.000	NA
ARITH ALL	1.374	1.377	0.944	1.107	1.143	1.051	1.016	0.974	1.078	1.042	1.030	1.000	0.995	1.022	1.105	0.927	1.008	1.021	1.014	1.000	0.956	1.000	1.000	NA
5 YR HI LO	NA	NA	NA	NA	NA	NA	1.000	1.000	1.000	1.000	1.000	1.000	1.003	0.999	1.021	0.996	1.012	1.006	1.000	1.000	NA	NA	NA	NA
7 YR HI LO	NA	NA	NA	NA	1.000	1.000	1.130	0.992	1.038	1.013	1.000	1.015	1.002	0.990	1.016	0.999	1.004	1.004	1.000	1.000	NA	NA	NA	NA
ALL YR HI LO	1.294	1.276	0.963	1.009	1.085	1.034	1.050	0.984	1.052	1.040	1.010	0.999	1.000	0.996	1.055	0.976	1.004	1.004	1.000	1.000	NA	NA	NA	NA
SELECTED	1.521	1.166	1.000	1.017	1.079	1.022	1.040	1.000	1.000	1.127	1.030	1.065	1.031	1.022	1.105	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Incurred Losses

RY	Development in Months																							
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	1	1	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	106,701	106,701	106,701	85,921	110,921	121,542	107,511	106,826	106,826	106,826	106,826	106,826	106,826	106,826
1996	65,000	15,001	15,001	15,001	35,001	70,001	70,001	20,000	-	50,001	53,940	67,940	67,940	67,940	67,940	102,248	108,206	108,206	119,916	119,916	119,916	109,456	109,456	109,456
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	282,000	299,445	733,820	861,104	859,104	1,254,635	1,254,635	925,870	753,994	657,142	667,199	698,719	642,886	642,886	635,092	635,092	635,092	635,092	635,092	635,092	635,093	635,093	635,093	635,093
1999	576,051	1,434,131	943,131	963,453	1,062,740	1,329,280	1,254,083	1,286,407	1,338,653	1,397,656	1,350,524	1,383,455	1,403,917	1,403,917	1,353,916	1,373,691	1,373,691	1,405,690	1,422,494	1,500,783	1,500,783	1,500,783	1,500,783	1,500,783
2000	2,102,117	2,481,718	2,630,090	2,819,602	2,876,382	2,857,665	2,921,118	3,236,350	3,301,716	4,107,206	4,330,459	4,291,056	5,028,325	4,988,325	4,966,651	5,210,072	5,247,170	5,471,619	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624	5,376,624
2001	302,096	1,050,043	1,500,023	1,219,231	1,178,913	1,082,184	1,141,921	1,231,922	1,243,082	1,344,127	1,522,137	1,480,155	1,503,301	1,515,771	1,415,769	1,659,746	1,638,565	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524	1,621,524
2002	200,004	652,311	588,414	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415
2003	250,003	250,882	297,387	306,532	306,532	341,531	443,402	500,006	478,961	550,916	578,916	578,916	481,483	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376
2004	300,004	258,090	827,611	812,287	812,287	811,862	811,862	983,570	961,290	1,480,232	1,690,604	1,743,171	1,818,773	1,818,773	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341	1,859,341
2005	75,000	69,181	61,467	61,467	59,884	66,985	66,985	91,585	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	100,001	86,012	86,012	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750
2008	100,000	57,687	57,687	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787
2009	50,001	50,001	105,943	105,943	105,943	105,943	105,943	142,619	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	1	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2017	50,000	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680	65,680
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Determination of Pure Premium

(1) RY	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) SELECTED <u>ULTIMATE</u>	(5) POTENTIAL <u>SITES</u>	(6) PURE <u>PREMIUM</u>
2008	51,787	66,060	58,924	2,055	29
2009	268,109	258,423	263,266	2,051	128
2010	-	-	-	2,049	-
2011	-	-	-	2,044	-
2012	-	-	-	2,040	-
2013	-	-	-	2,040	-
2014	-	-	-	2,039	-
2015	481,642	328,150	404,896	2,038	199
2016	-	-	-	2,038	-
2017	325,861	128,301	227,081	2,037	111
2018	-	-	-	2,036	-
TOTAL	1,127,399	780,934	954,167	22,467	42

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Paid Bornhuetter-Ferguson Method

(1) RY	(2) POTENTIAL SITES	(3) PROJECTED PURE PREM	(4) TRENDED PURE PREM	(5) DETRENDED PURE PREM	(6) EXPECTED LOSSES	(7) PERCENT UNPAID	(8) EXPECTED UNPAID	(9) PAID LOSSES	(10) INDICATED ULTIMATE	(11) INCURRED LOSSES	(12) IBNR RESERVE	(13) CASE RESERVE	(14) ULTIMATE PURE PREM
2008	2,055	29	35	89	182,372	29.5%	53,728	51,787	105,515	51,787	53,728	-	51
2009	2,051	128	153	91	185,658	39.0%	72,330	163,657	235,987	179,722	56,265	16,065	115
2010	2,049	-	-	92	189,186	44.6%	84,462	-	84,462	-	84,462	-	41
2011	2,044	-	-	94	192,499	51.5%	99,070	-	99,070	-	99,070	-	48
2012	2,040	-	-	96	195,965	57.4%	112,491	-	112,491	-	112,491	-	55
2013	2,040	-	-	98	199,884	62.6%	125,074	-	125,074	-	125,074	-	61
2014	2,039	-	-	100	203,782	66.1%	134,602	-	134,602	-	134,602	-	66
2015	2,038	199	211	102	207,755	70.4%	146,331	142,401	288,732	195,789	92,943	53,388	142
2016	2,038	-	-	104	211,910	74.7%	158,292	-	158,292	-	158,292	-	78
2017	2,037	111	114	106	216,043	83.7%	180,735	53,255	233,990	65,680	168,311	12,425	115
2018	2,036	-	-	108	220,255	91.0%	200,523	-	200,523	-	200,523	-	98
TOTAL	22,467				2,205,309		1,367,636	411,100	1,778,736	492,977	1,285,759	81,877	79

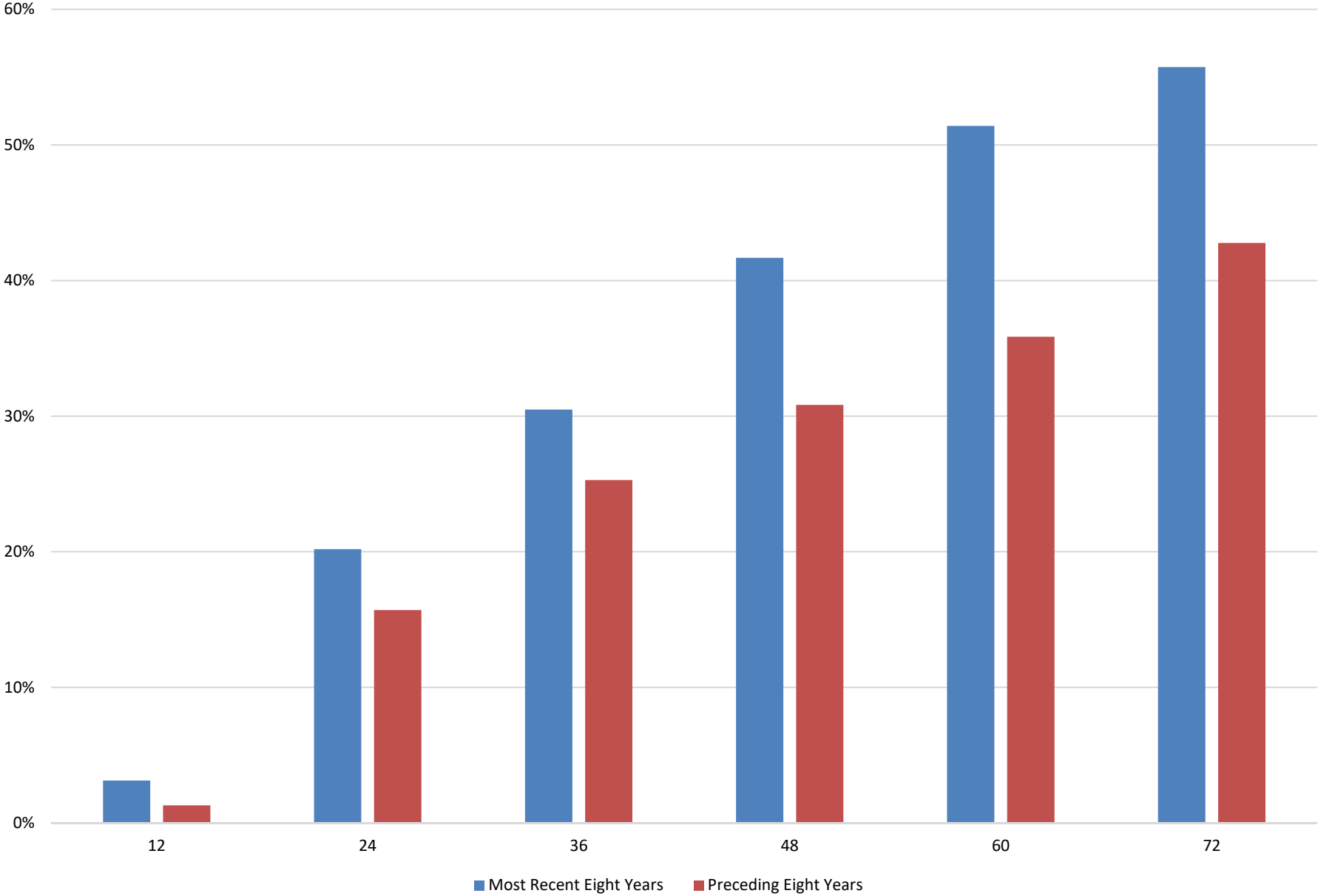
<u>Pure Premium Selection</u>		Trend =	1.020
3-Year Average x Latest	108		
5-Year Average x Latest	65		
All Year Average x Latest	51		
Selected Pure Premium	108		

Missouri Petroleum Storage Tank Insurance Fund
Reserve Study as of June 30, 2018
Remedial AST
Incurred Bornhuetter-Ferguson Method

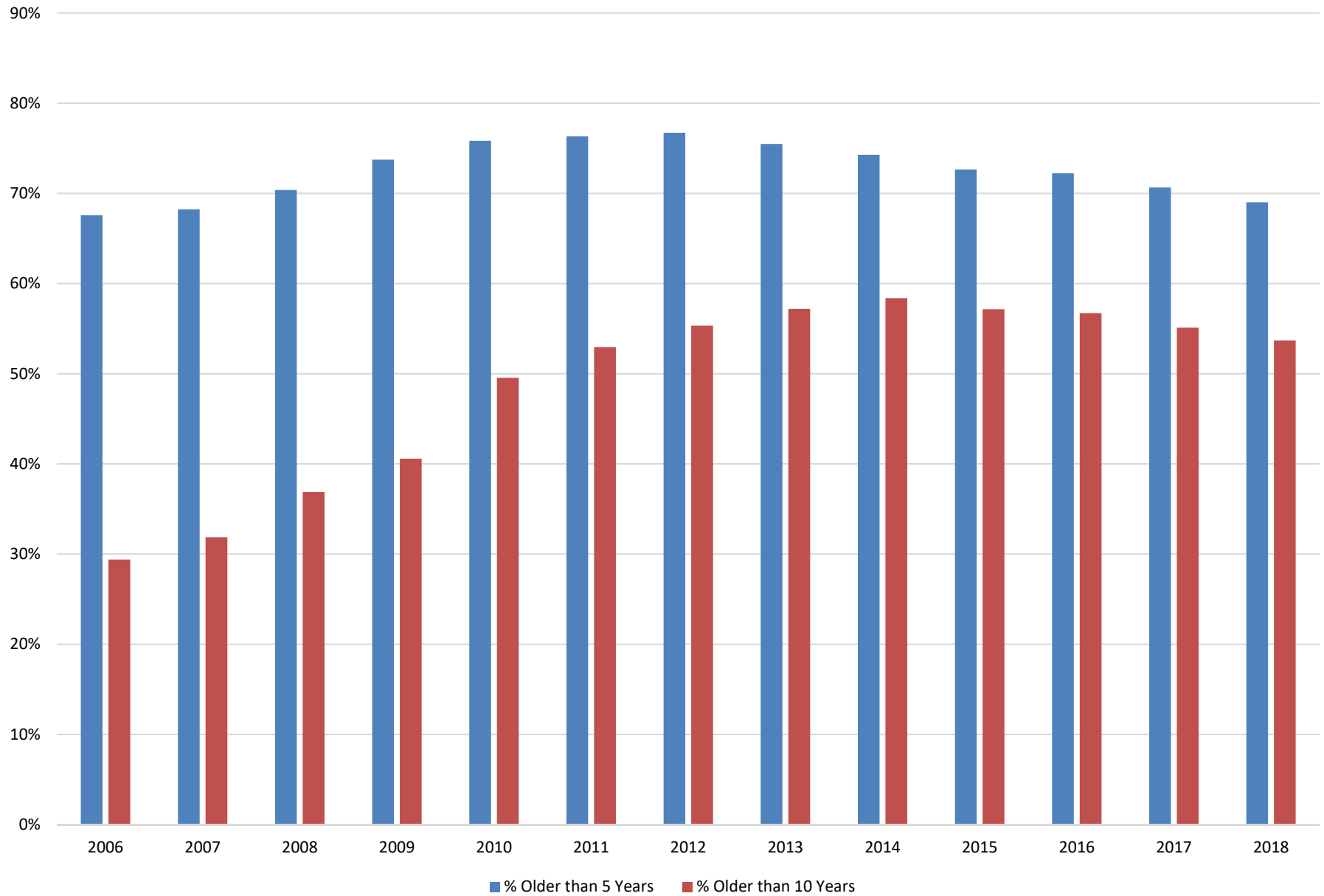
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<u>RY</u>	<u>POTENTIAL</u> <u>SITES</u>	<u>PROJECTED</u> <u>PURE PREM</u>	<u>TRENDED</u> <u>PURE PREM</u>	<u>DETRENDED</u> <u>PURE PREM</u>	<u>EXPECTED</u> <u>LOSSES</u>	<u>PERCENT</u> <u>IBNR</u>	<u>EXPECTED</u> <u>IBNR</u>	<u>INCURRED</u> <u>LOSSES</u>	<u>INDICATED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSSES</u>	<u>UNPAID</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>ULTIMATE</u> <u>PURE PREM</u>
2008	2,055	29	35	89	182,372	21.6%	39,405	51,787	91,192	51,787	39,405	-	44
2009	2,051	128	153	91	185,658	30.5%	56,541	179,722	236,263	163,657	72,606	16,065	115
2010	2,049	-	-	92	189,186	30.5%	57,616	-	57,616	-	57,616	-	28
2011	2,044	-	-	94	192,499	30.5%	58,624	-	58,624	-	58,624	-	29
2012	2,040	-	-	96	195,965	33.1%	64,913	-	64,913	-	64,913	-	32
2013	2,040	-	-	98	199,884	34.6%	69,065	-	69,065	-	69,065	-	34
2014	2,039	-	-	100	203,782	39.3%	80,135	-	80,135	-	80,135	-	39
2015	2,038	199	211	102	207,755	40.3%	83,799	195,789	279,588	142,401	137,187	53,388	137
2016	2,038	-	-	104	211,910	40.3%	85,475	-	85,475	-	85,475	-	42
2017	2,037	111	114	106	216,043	48.8%	105,447	65,680	171,126	53,255	117,871	12,425	84
2018	2,036	-	-	108	220,255	66.3%	146,106	-	146,106	-	146,106	-	72
TOTAL	22,467				2,205,309		847,125	492,977	1,340,102	411,100	929,002	81,877	60

<u>Pure Premium Selection</u>		Trend =	1.020
3-Year Average x Latest	108		
5-Year Average x Latest	65		
All Year Average x Latest	51		
Selected Pure Premium	108		

Percent of Total Reported Claims Closed with Payment in First 72 Months After Report



Backlog of Claims Older than 5 or 10 Years as a Percent of Total Open



Backlog of Claims Older than 5 or 10 Years, Absolute Quantities

